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The economic integration of the countries of Western Europe has an important bearing on United States agriculture. An understanding of this integration and its possible effects is especially important in evaluating current foreign trade policy proposals. The first article in this issue traces the recent development of the European economy. The author provides an analysis of forces affecting the demand for United States agricultural products in Western Europe. A more detailed analysis by the same author of European import demand will appear in the July issue.

One aspect of the economic integration in Europe is presented in the second article, which discusses the European Economic Community (Common Market). Starting with the European Coal and Steel Community, which removed all trade barriers on coal and steel among member countries, the same countries later agreed to gradually eliminate trade barriers on other goods by 1970. The article gives special emphasis to the effect of breaking down trade barriers. To show how the European Economic Community operates, the author also describes the administrative structure of the organization.

The effective marketing of many commodities depends on establishing quality standards. These standards should be based on characteristics of the product that buyers and sellers recognize and consider important. The current standards for quality of shell eggs are basically the same as those introduced by the U. S. Department of Agriculture about 35 years ago. The third article reports a study which sought to answer the question: Do the U. S. standards for interior egg quality adequately reflect characteristics that consumers feel are important? The results indicate a rather close agreement between consumer preferences and the standards.

Marked changes in the pattern of farming occurred in the decade of the 1950's. For Illinois there was a decline of about one-fourth in farm population and about 20 percent in farm numbers. The farmers that remained made adjustments in the organization of their farms. The fourth article in this issue analyzes changes on 109 east-central Illinois grain farms. Although production (in constant prices) on these farms increased about one-half during the period, the total amount of inputs increased much less.

Hog production continues to be an important source of income to Illinois farmers — in 1960, sales of hogs accounted for 20.8 percent of cash farm receipts. Some producers are changing methods of production as a part of the process of specialization. In deciding on a method of hog production, it is useful to know the results of various methods under farm conditions. Such results are reported in "Farmer Experiences With Selected Hog-Producing Methods," which is based on information from 262 hog producers.

The Impact of Western European Integration on U. S. Exports: Part I

S. C. SCHMIDT

TOTAL AMERICAN EXPORTS IN the fiscal year ending June 30, 1960, reached \$19 billion, of which agricultural commodities accounted for \$4.5 billion or roughly one-fourth.¹ During the last ten years the contribution of agricultural exports to over-all American trade has fluctuated from less than one-fifth to more than one-fourth of all goods sold in foreign markets.

In fiscal year 1960-61 agricultural exports totaled \$4.9 billion, up 10 percent from the previous year. As Table 1 indicates, increases in wheat, cotton, tobacco, and soybeans more than offset declines in feed grains, rice, and animal and vegetable fats and oils.

These diverse trends in commodity exports were accompanied by a changing pattern in destinations (Table 2). Agricultural exports to Japan increased 25 percent during fiscal year 1960-61 while shipments going to the United Kingdom dropped 2 percent. As a result of these developments, Japan replaced the United Kingdom, for the first time, as the best customer of American agricultural commodities. Notable increases in exports to Canada, India, Italy, and Pakistan have taken place, although there has been no change in the relative importance of the respective countries as importers. In contrast to these gains, exports to member countries of the European Economic Community (or Common Market) excepting Italy declined over those made a year earlier.

¹ OEEC Statistical Bulletins, Foreign Trade, Series B.

Table 1. — U. S. Agricultural Exports by Commodity, Fiscal Year

Commodity	1959-60	1960-61	Change
	(million dollars)		(percent)
Cotton.....	826	937	+13
Wheat and flour ^a ...	870	1,150	+32
Feed grains ^{a, b}	540	531	-2
Rice, milled ^a	136	132	-3
Tobacco, unmanufactured.....	342	384	+12
Vegetable oils and seeds.....	543	551	+1
Soybeans.....	300	344	+15
Edible vegetable oils ^c	178	146	-18
Animals and products ^a	583	613	+5
Fats and oils.....	185	175	-5
Meats and products.....	113	137	+21
Dairy products ^a ...	127	131	+3
Total ^d	4,515	4,944	+10

^a Includes private relief.

^b Excludes products.

^c Cottonseed and soybean.

^d Due to omissions, individual items do not add up to the total.

Source: USDA, ERS, Foreign Agricultural Trade Digest, August, 1961, p. 1.

In 1959-60, Europe as a whole absorbed 48 percent, Asia 25 percent, Latin America 13 percent, Canada 10 percent, and Africa and Oceania the remaining 4 percent of all U. S. agricultural exports.²

It would be misleading, however, to appraise our export potentials only in terms of changes in size and regional distribution. To complete the picture we must add a third dimension, namely the financial aspects of our export trade. It is not enough to know the destination and volume of exports; we must also

² Comparable data for fiscal year 1960-61 were not available.

Table 2. — U. S. Agricultural Exports by Country of Destination, Fiscal Year

Country	1959-60	1960-61	Change
	(million dollars)	(million dollars)	(percent)
Japan.....	441	553	+25
United Kingdom....	474	466	-2
Canada.....	410	455	+11
India.....	278	346	+24
Netherlands.....	339	324	-4
West Germany.....	374	322	-14
Italy.....	155	214	+38
Belgium and Luxembourg....	134	130	-3
France.....	119	112	-6
Pakistan.....	69	106	+54
Philippines.....	60	71	+18
Brazil.....	65	70	+8
Taiwan.....	57	67	+18
Mexico.....	59	62	+5
Total ^a	4,527	4,944	+9

^a Due to omissions, individual terms do not add up to the total.
Source: USDA, ERS, *Foreign Agricultural Trade Digest*, Washington 25, D. C., September 1961, p. 1.

know the amount and form in which each customer paid for these items. In this context our aggregate exports of \$4.5 billion in fiscal year 1959-60 can be divided into three categories: (1) commercial exports without government assistance, (2) commercial exports with government assistance, and (3) exports under specified government programs.³

The first category designates bona fide commercial transactions and includes commodities bought with loans from the Export-Import Bank and credits extended by the Commodity Credit Corporation. Of a total of \$1.9 billion, meats, fats, oilseeds, fruits, vegetables, tobacco, and hides and skins made up the bulk of commodities sold.

In contrast with the first category, commodities exported under semicommercial exports, whether through private trade channels or from CCC stocks, require assistance in form of export payments (subsidies) in cash or in kind to make up for the difference between domestic and world market prices. Such

³ *Foreign Agricultural Trade Outlook Charts 1961*, USDA, For. Agr. Serv., November, 1960, Table 4, p. 46.

transactions accounted for \$1.3 billion. Cotton, wheat, and feed grains were the principal commodities involved.

The category of special government export programs represents disposals by means of (a) sales for foreign currency, (b) grants and donations, and (c) barter. They amounted to \$1.3 billion and were made up mostly of wheat and flour, cotton, and oils. The amount of American exports moving under semicommercial and special government export programs (58 percent) underscores the nature of our export difficulties. As a corollary, if dollar exports with and without government assistance are combined, they represent about 70 percent of all agricultural exports in 1959-60.

Factors Affecting Trade in Agricultural Commodities

Factors such as national income, population, availability of supplies, relative prices, and merchandising methods can be considered as general in nature with their influence being transmitted to both domestic and foreign markets. There are also specific factors, such as terms of trade, gold and foreign exchange reserves, volume of exports, receipt of foreign aid, level of supply and price of agricultural commodities in other exporting countries, and institutional arrangements governing foreign trade, which influence only the international transactions of a particular country.⁴

We can now proceed to discuss the probable course of export prospects in each market category. For convenience, distinction will be made only between two types of transactions — commercial

⁴ "Terms of trade" is defined as the ratio of an export price index and an import price index. Since export prices indicate the level of prices received for goods sold abroad, while import prices reflect the level of prices paid for foreign goods, their ratio may show the nature of changes in a country's trading position.

sales, with and without government assistance, and surplus disposals carried out under governmental programs.

Commercial Markets: Western Europe

In general, the industrial countries of Western Europe, Japan, Canada, and Oceania, or "hard-currency countries," represent the commercial customers, while the industrially less-developed countries of the world form our "conditional customers."⁵ Since the countries of Western Europe combined constitute the largest market for U. S. farm products, particular attention must be given to economic trends and policies pursued or contemplated by them.

Institutional setting. In facing up to postwar economic problems, especially reconstruction, European countries soon recognized that their progress and prosperity were interdependent. On April 16, 1948, under the terms of the "Convention for European Economic Cooperation," seventeen European countries undertook certain general obligations and set up an international body to carry them out. The contracting parties agreed "to join together to make the fullest collective use of their individual capacities, to increase their production, expand their commerce, progressively reduce barriers to trade among themselves, promote full employment and restore or maintain the stability of their economies and general confidence in their national currencies." The Organization for European Economic Cooperation (OEEC) was set up to aid in the fulfillment of these objectives. The OEEC comprises all noncommunist countries of Europe except Finland. The fundamental characteristic of the OEEC's method of work is the rule of unanimity in matters of policy meas-

ures. However, once taken, they become binding on all member countries.

In the course of implementing some of their major objectives, the OEEC countries instituted the European Payments Union (1950) and adopted a code of trade liberalization (1950). Other stages of European economic integration include the formation of the Benelux Customs Union (1948), the European Coal and Steel Community (ECSC, 1952), the European Economic Community (EEC, 1957), and the European Free Trade Association (EFTA, 1960).⁶

The Western European market may be considered as composed of three regional submarkets: the European Economic Community or "Common Market," the European Free Trade Association or "Outer Seven," and the remaining unattached countries.⁷ The EEC encompasses six countries, Belgium, Luxembourg, France, West Germany, Italy, and the Netherlands, while the EFTA consists of the United Kingdom, Austria, Denmark, Norway, Sweden, Switzerland, and Portugal. Although both groups move toward the elimination of intra-regional trade impediments, EFTA member countries — unlike their counterparts in EEC — are free to set their own tariffs against third countries. Of the total of 48 percent of all U. S. farm commodities exported in fiscal year 1959-60, the Common Market countries accounted for 23 percent, the Outer Seven for 16 percent, and other countries for 9 percent.⁸

Economic setting. Western Europe in 1959 had 326 million inhabitants, al-

⁶ For a chronological summary of various events relating to development of European economic integration see, OEEC, *A Decade of Cooperation, Achievements and Perspectives*, Paris, April, 1958, p. 9-14.

⁷ See also "The European Common Market" by R. W. Bartlett in this issue of *Illinois Agricultural Economics*, pp. 11-20.

⁸ *Foreign Agricultural Trade Outlook Charts 1961*, USDA, For. Agr. Serv., November, 1960, p. 16.

⁵ The term hard-currency as opposed to soft currency implies the quality of free convertibility into gold, dollars, or any other foreign exchange media at the discretion of the holder.

Table 3. — Comparative Economic Indicators Relating to OEEC Member Countries and United States, 1951-1959

	1951	1952	1953	1954	1955	1956	1957	1958	1959	Growth rate 1951- 1959 (percent)
Population, million										
Europe.....	303.8	306.2	308.7	311.3	314.0	316.9	320.0	323.2	326.5	7.5
U.S.....	156.4	159.0	161.7	164.6	167.5	170.5	173.5	176.4	179.4	14.7
U.S. as percent of Europe's....	51.5	51.9	52.4	52.8	53.3	53.8	54.2	54.6	54.9	196.0
GNP at market prices (billions of U.S. dollars) ^a										
Europe.....	165.7	183.6	194.3	206.4	224.6	246.1	263.2	268.8	275.9	66.5
U.S.....	331.2	349.5	367.2	364.8	398.9	420.3	444.0	446.0	483.4	46.0
Europe's as percent of U.S....	50.0	52.5	52.9	56.6	56.3	58.5	59.3	60.3	57.1	144.6
Total imports (billions of U.S. dollars) ^a										
Europe.....	34.1	32.8	32.0	34.4	39.3	43.5	47.3	44.2	46.7	37
U.S.....	10.8	10.7	10.8	10.2	11.3	12.5	12.9	12.7	14.9	38
Percent of world imports										
Europe.....	42.3	41.3	42.3	43.6	44.6	44.7	44.4	44.5	44.8	
U.S.....	13.4	13.4	14.3	13.0	12.8	12.9	12.1	12.8	14.3	
Total exports (billions of U.S. dollars) ^a										
Europe.....	27.7	27.6	28.0	30.2	33.7	37.1	40.6	40.4	43.7	57
U.S.....	14.9	15.0	15.6	14.9	15.4	18.8	20.6	17.7	17.4	17
Percent of world exports										
Europe.....	36.1	37.4	37.4	39.0	40.0	39.7	40.4	42.2	43.2	
U.S.....	19.4	20.3	20.8	19.3	18.3	20.1	20.5	18.5	17.2	
Exports as percent of GNP at market prices										
Europe.....	16.7	15.0	14.4	14.6	15.0	15.1	15.4	15.0	15.8	86
U.S.....	4.5	4.3	4.2	4.1	4.0	4.5	4.6	4.0	3.6	37
Imports as percent of GNP at market prices										
Europe.....	20.6	17.9	16.5	16.7	17.5	17.7	18.0	16.4	16.9	56
U.S.....	3.3	3.1	3.0	2.8	2.8	3.0	2.9	2.8	3.1	83
Gold and dollar reserves (billions of U.S. dollars)										
Europe.....	9.9	10.7	12.9	14.6	15.4	15.8	17.1	21.0	20.5	
U.S. (gold).....	22.9	23.2	22.1	21.8	21.7	22.0	22.8	20.6	19.5	

^a In current prices and current exchange rates.

Source: OEEC Statistical Bulletins, *General Statistics*, No. 1 (January, 1961).

most double the population of the United States (Table 3⁹). An interesting feature of population trends is the wide discrepancy in growth rates between the two regions; U. S. population increased nearly 15 percent from 1951 to 1959 while that of Europe increased at only half that rate. Should the present trend continue, it may have a dampening effect on future European import require-

ments. By the same token, the extent that this development enhances Europe's export capacity, the United States may expect to encounter stiffer competition both in Europe and in third markets. It is conceivable, however, that economic growth will exert a continued pressure on the labor market and price structure and reduce the traditional European cost economies associated with lower factor costs, particularly labor.

Between 1951 and 1959, gross national product (GNP) in Western Europe rose

⁹ Due to uneven time period coverage and to afford comparability only the years 1951-1959 are being considered.

by 67 percent compared with 46 percent in the United States.¹⁰ This is a remarkable rate even if one disregards the fact that economic advance has been interrupted twice by the recessions of 1952 and 1958 and the upheavals created by the Korean War and Suez crisis. As a consequence, the goods and services produced in Europe in 1959 amounted to 57 percent of those of the U. S. This represented a gain of about 7 percentage points over 1951. These results came from a combination of factors; however, economic cooperation through OEEC and the economic integration within the Benelux Union and the ECSC were crucial.

Prospects for Western European Import Requirements

Assuming that the present trend continues, what inferences may we draw about imports? From available material, it is difficult to determine how much the volume of imports has been or will be influenced by changes in GNP. Further, the volume of imports may also affect the GNP. Over the period 1951-1959, GNP rose almost twice as fast as imports, suggesting a generally declining propensity to import. It should be added, however, that rates of growth are inadequate measures of change. First, the magnitude of change may be subject to random disturbances prevailing in years of comparison as well as distortions that may arise from differences in size between imports and GNP.¹¹ Second, fluc-

tuations in prices and exchange rates, particularly if they differ as to amplitude and direction, may also distort inferences drawn from the import-GNP ratio. However, apart from the cyclical effect, the import-GNP ratio deviated little from the nine-year average of 17.5 percent.

Barring the recurrence of internal and external disturbances in the 1960's, it may be expected that Europe's need for imports will grow proportionately to GNP. Exports would have to grow faster than this, however, if Europe were both to increase its aid contribution to underdeveloped countries and to maintain its current favorable balance-of-payments position. The prospect of growth of imports proportional to GNP does not imply that all exporting countries will share proportionally in the expansion. On the contrary, indications are that extra-European imports are of a marginal character; that is, local sources receive preference over supplies from outside competitors.¹²

Gold and foreign exchange reserves.¹³ Western Europe's gold and foreign exchange reserves have been growing steadily since 1951, and together with the successful introduction of non-resident convertibility of major currencies at the end of 1958, represented a significant sign of economic strength and a beneficial redistribution of world reserves. In spite of an apparent parallelism between U. S. gold losses and European gold and foreign exchange gains, the latter was also affected by (1) acquisition of newly mined gold, (2) settlements through the European Payments Union, and (3) a shift in the terms of trade in favor of the industrial countries resulting from the fall in raw-material

¹⁰ The record in some European countries is better than in others, but in every one striking increases have been made in economic growth. See, OEEC Statistical Bulletins, *General Statistics*, No. 1, January, 1961, pp. 10-26.

¹¹ For instance, on account of inflationary pressures resulting from the great upsurge in demand for primary products following the Korean War, the 1951 imports may overstate their importance as reflected in the all-time high (20.6 percent) import-GNP ratio. Within a year the average unit cost of extra-European imports rose by approximately 45 percent.

¹² Further discussion of European imports by origin and major commodity groups will appear in the next issue of *Illinois Agricultural Economics*.

¹³ Gross official holdings of central banks.

import prices. Moreover, two additional factors contribute to the substitution of gold for dollar assets: the traditional European preference for gold as a monetary reserve and the discrepancy in short-term interest rates favoring the conversion of U. S. government securities and other dollar investments into gold. To the extent that the improvement in the international liquidity position of European countries lessens the pressure for maintenance of discrimination against dollar imports, gold and dollar reserves may stimulate extra-European trade.

Exports. From the time of its inception, OEEC's objectives in the field of international trade have been to increase exports to and reduce imports from the dollar area. The dollar area consists of the United States, Canada, Central America, Bolivia, Colombia, Ecuador, Venezuela, Liberia, and the Philippines. The dollar problem as generally conceived in post-world War II literature stemmed from inadequate American imports on one hand and persistently high foreign demand for this country's products on the other.¹⁴ Increased European exports were needed for the sake of international solvency and subsequently to allow higher imports for reconstruction and development. Obviously, no country can afford to maintain indefinitely an adverse balance of payments by drawing on gold and dollar reserves, liquidating foreign investments, or purchasing on credit. Such a course may lead to attrition of international purchasing power, causing either currency depreciation, foreign exchange controls, or adoption of a variety of other discriminatory measures.

The interrelationship between exports

¹⁴ The findings of the "President's Material Policy Commission" (Resources for Freedom, June 1952) included investigations of prospective American import needs which, in turn, have stimulated studies of means for coping with the dollar gap.

and ability to import is only one aspect of the process of causation; the other relates to the effect of exports on general economic activity or its indicator, GNP. From the rates of growth of European exports (57 percent) and European GNP (67 percent) presented in Table 3, it appears that they are closely related. The rapid increase in exports, through its direct effects on the flow of incomes and consequently on the level of domestic demand, stimulated the expansion of aggregate output (GNP). The effect of a rise in exports on GNP and national income depends, among other things, upon their relative sizes. Considering that the export-GNP ratio has been about 15.2 percent over the period under review, a strong cause-and-effect relationship seems plausible.¹⁵

In conclusion, continuation of past export trends should provide optimism over American commercial sale potentials.

Western Europe and World Trade

The seventeen member countries of OEEC depend more heavily on foreign trade than does the United States. In 1959, for example, their combined imports and exports accounted for 45 and 43 percent, respectively, of world totals compared with 14 and 17 percent for the United States (Table 3). In addition, their contribution to world trade during the 1950's showed a markedly dynamic character, which reflects completion of postwar reconstruction and subsequent re-entrance to world markets. Aggregate imports and exports of OEEC member countries increased by 37 and 57 percent, respectively, from 1951 to 1959 (Table 3). In contrast, the increases in aggregate imports and exports of the United States in the same period were 38 and 17

¹⁵ The coefficient expressing how much a given change in exports causes national income to expand is called the foreign trade multiplier.

percent, respectively.¹⁶ These data underscore the fact that Western Europe constitutes a vital market for most of the countries and that any change in economic policy, domestic or foreign, may influence existing patterns of trade.

Economic regionalism and trade. While most of the economic factors considered are trade-creative in nature and enhance the export prospects for American farm commodities, a number of institutional arrangements may act to nullify the effect of these factors. The idea that the route for economic development is through the formation of enlarged and protected regional markets has been embodied by the European Economic Community and the European Free Trade Association as well as by their counterparts in Latin America and the Middle East. To be sure, the freeing of intra-European trade, whether through the adoption of the Code of Liberalization and the establishment of the European Payments Union or through the formation of closely knit (EEC) or flexible (EFTA) customs unions, provides larger markets to their members, but by doing so, there is a temptation to reduce trade with the outside world and pave the way toward a new economic isolationism. The European Payments Union in cooperation with the Bank for International Settlements acts as a clearinghouse for the compensation of net balances arising from intra-OEEC transactions and by making available multilateral payments facilities reduces pressures for discriminations on balance-of-payments grounds.

The Code of Liberalization. According to the provisions of the Code, mem-

ber countries of the OEEC were required to abolish quantitative restrictions on specified percentages of their private imports (state trading excluded) procured from intra-OEEC sources at specific dates.

In pursuit of this objective, statutory liberalization percentages were established not only for aggregate imports but also for each of the three major commodity categories: food and feeding stuffs, raw materials, and manufactures.¹⁷ Taken as a whole, the liberalization percentage of all OEEC member countries combined amounted to 92 percent in January, 1960 (Table 4). The progress is mainly attributable to Benelux and other members of EEC as well as to the United Kingdom. Apart from the gains in raw materials, the remaining quantitative restrictions on agricultural and manufactured products are still of considerable importance. The less favorable treatment accorded to agricultural commodities may be seen in better perspective if one takes into account the fact that state trading is more common in these than in other commodities. The economic consequences of state trading can be tantamount to those of a system of quantitative restrictions.

As a result of the high degree of liberalization, intra-OEEC trade continued to increase more rapidly than European trade with the rest of the world, including the United States.¹⁸ Thus the future course of trade relations between Europe and the United States will depend to a large extent on the rate at which prevailing quantitative restrictions on dollar imports are lifted. On March 1, 1960, the aggregate percentage

¹⁶ As indicated above, the importance of foreign trade to the economy of OEEC countries is also emphasized by the fact that they export on the average 15.2 percent of all goods and service produced (GNP) whereas the United States exports only about 4 percent.

¹⁷ For details regarding the calculation of percentages of liberalization see the *Sixth Annual Report of the OEEC*, Paris, March, 1955, Appendix A, p. 149.

¹⁸ OEEC Statistical Bulletins, *Foreign Trade*, Series A.

Table 4. — Liberalization of Intra-European Trade and Imports From North America, 1960

Country	Percent of private trade liberalized							
	Intra-European ^a (Jan. 1, 1960)				North America ^b (March 1, 1960)			
	Food and feeding stuffs	Raw materials	Manufactured products	Total	Food and feeding stuffs	Raw materials	Manufactured products	Total
Austria.....	79.4	98.6	87.2	90.3	(c)	(c)	(c)	45
Benelux.....	89.8	99.5	96.6	97.0	88	80	90	86
Denmark.....	80.6	98.2	79.0	86.2	92	100	98	97
France.....	85.6	99.0	85.3	91.2	(c)	(c)	(c)	80
Germany.....	86.7	91.8	100.0	92.2	100	69	98	80
Iceland.....	56.5	40.9	15.0	29.0	86	67	15	33
Ireland.....	84.6	97.0	88.9	90.2	7	43	4	15
Italy.....	94.6	100.0	99.2	98.4	(c)	(c)	(c)	90
Norway.....	83.3	93.2	77.1	81.4	99	100	75	91
Portugal.....	88.2	98.9	91.7	93.7	100	99	96	98
Sweden.....	79.6	100.0	90.6	92.6	92	100	86	91
Switzerland.....	67.8	100.0	94.3	91.4	97	100	98	99
United Kingdom.....	94.7	100.0	96.9	97.2	100	100	69	93
Total.....	89.0	98.0	89.8	92.3	(c)	(c)	(c)	86

^a Base year: 1948; 1952 for Austria; 1949, Germany; 1955, Benelux. ^b Base year 1953. ^c Not available.
Source: Eleventh Annual Economic Review of the OEEC: *Europe and the World Economy*, Paris, April, 1960.

of liberalization of imports to OEEC countries from North America stood at 86 percent compared with 72 percent in the preceding year (Table 4). While the remaining discrimination on over-all imports may not appear substantial, its importance in relation to certain commodity groups, such as agricultural and manufactured products, and for specific countries, for example, Benelux and Germany, should not be disregarded.

The European Economic Community and European Free Trade Association

The treaties underlying the formation of these economic groupings provide for the achievement of customs union or free trade area through the gradual elimination of tariffs and quotas on trade between member countries. When fully implemented, the Common Market will provide for (1) complete freedom of movement, not only for all commodities exchanged between the member countries, but also for capital and labor, (2) coordination of economic, financial, commercial, and social policies, (3) establishment of a common agricultural

policy, and (4) erection of a common external tariff on goods coming from outside countries.

Internal tariffs and quotas are scheduled to be eliminated by 1966, except for internal quotas on industrial goods, which are expected to be removed by the end of 1961. Transition to a unified common market with a common external tariff is scheduled to be realized by 1970. The first step toward this goal was made on January 1, 1961, when member countries adjusted their individual commodity rates 30 percent toward the new common tariff. Since the final external tariff will represent the average of the members' basic rates (1957 rates), and because of differences among national tariff levels, some of the members will be lowering certain rates (France and Italy), and others will have to increase the rates (Benelux and Germany) to bring them to the level of the common tariff.

In contrast to the European Economic Community, the Free Trade Association at the end of the transition period in 1970 will provide only for the free movement of manufactured goods. Each

member will continue to retain control over its own economic and agricultural policies and will remain free to adjust its own tariff against imports from outside countries.

Already by July 1, 1961, as a result of an acceleration in the time table, both the Common Market and the Free Trade Association countries had reduced their internal tariffs by 30 percent from rates in effect January 1, 1957, and indications are that members of the former group plan to execute a further cut of 10 to 20 percent during the remainder of 1961.

Impact on U. S. trade. We may divide the direct consequences into two general categories — impact on agricultural commodities and impact on non-agricultural commodities.¹⁹ In the following, only the impact on agricultural commodities is considered.

The aspect of the common agricultural policy that is of most direct concern to the United States is the tendency towards self-sufficiency and agricultural protectionism. For the achievement of these objectives, the Common Market countries plan to introduce a system of import restrictions (quotas, licensing), variable import duties, and centrally coordinated marketing arrangements.²⁰ Implementation of these measures would lead to disruption of the international trade necessary for specialization and

comparative efficiency of production. In absence of governmental interferences, international market prices perform the same allocative functions as domestic prices. That is, importers would shop in those markets where prices are lowest and consequently the relative competitiveness of exporters would determine their respective shares in the world market. However, when governments step in and introduce discriminatory restrictions on commodity flows, the level of prices loses much of its importance as a trade-allocating device. Continued control over imports and prices prevents the movement toward economically rational trade intercourses.

Price supports. Governmental programs for controlling farm prices are not a unique feature of the currently proposed Common Market agricultural programs; they have been adopted and rationalized on a number of grounds in the past by the major net exporters and importers of farm products. In a number of cases importing countries guarantee minimum prices to growers that are higher than U. S. support prices, particularly for food grains such as wheat and rye (Table 5).

The fact that only three European importing countries (Germany, the Netherlands, and the United Kingdom) have maintained price supports on feed grains should not be construed as a favorable factor in U. S. export prospects. Pricing and trade for all grains under the proposed common agricultural policy will be subject to unified regulations executed by regional agencies. The main task of these agencies will be to stimulate production by price incentives, buying on the domestic market, and import controls.

Similar arrangements, without uniform target prices, are contemplated for livestock and livestock products. The external effect of agricultural protectionism is likely to be a shift to sources

¹⁹ For an analysis of the probable effects of the EEC upon U. S. exports of nonagricultural commodities, see Howard S. Piquet, "First Effects of the Common Market: The Impact of Changing Tariffs on U. S. Exports," *The European Common Market*, American Management Association, New York, 1958, p. 124-159; and the Federal Reserve Bank of Chicago, "Economic Integration in Europe its Significance for U. S. Exports," *Business Conditions*, April, 1961, p. 7-16.

²⁰ The author will examine these points in greater detail in a forthcoming publication "An Analysis of the Structure of Imports of the EEC, 1951-59." See also *Proposals for a Common Agricultural Policy in EEC*, Political and Economic Planning, Occasional Paper No. 5, London, February, 1960.

Table 5. — Grains: Support Prices, Dollar per Bushel Equivalents, in Specified Countries, 1960^a

Country	Wheat		Rye		Corn		Barley		Oats	
	Dol-lars	Per-cent of U.S.	Dol-lars	Per-cent of U.S.	Dol-lars	Per-cent of U.S.	Dol-lars	Per-cent of U.S.	Dol-lars	Per-cent of U.S.
<i>Export countries</i>										
United States.....	1.78	....	.90	....	1.06	....	.77	....	.50	....
Argentina.....	1.23 ^b	69.0	.74	82.2	.89 ^b	84.0	.64 ^b	83.1	.42 ^b	84.0
Australia.....	1.69	95.0	....	....	....	....	....	....	....	....
Canada.....	1.42	79.8	....	....	....	....	.97	126.0	.61	122.0
France.....	2.22 ^c	124.7	1.66	184.4	1.91	180.2	1.42	184.4	....	....
<i>Import countries</i>										
Austria.....	2.64 ^e	148.3	2.26	251.1	....	....	....	....	....	....
Belgium.....	2.56 ^d	143.8	....	....	....	....	....	....	....	....
Brazil.....	2.17 ^e	122.0	....	....	.57 ^{b, e}	53.8	....	....	....	....
Denmark.....	1.93	108.4	1.73	192.2	....	....	....	....	....	....
West Germany.....	2.97	166.8	2.52	280.0	....	....	2.12 ^f	275.3	1.13 ^b	226.0
India.....	1.98—	111.0—	....	....	....	....	....	....	....	....
	2.44	137.0								
Italy.....	2.82 ^e	158.4	....	....	....	....	....	....	....	....
Japan.....	2.86	160.7	....	....	....	....	2.22 ^g	288.3	....	....
Netherlands.....	2.33	130.9	1.94 ^b	215.5	....	....	1.62 ^h	210.4	1.03 ^b	206.0
Pakistan.....	2.07	116.3	....	....	....	....	....	....	....	....
United Kingdom....	2.01	112.9	1.50	166.7	....	....	1.72	223.4	1.08	216.0

^a Fixed on average guaranteed base prices for standard grades. The f.o.b. points vary. Some prices are subject to one or more deductions. Others are gradually increased by specified amounts during a designated period after harvest to offset farm storage costs.

^b Average for two types.

^c For soft wheat. Higher prices designated for hard wheat.

^d "Directional" (target) price.

^e Converted at the January 31, 1961, free market exchange rate of 230 cr. = \$1.00.

^f Average for three types.

^g Average for common and naked barley.

^h Target price for grain grown on clay soils.

Source: *Prospects for Foreign Trade in Wheat, Rice, Feed Grains, Dry Peas, Dry Beans, Seeds, Hops*, USDA, For. Agr. Serv., May, 1961, p. 9.

within the EEC and hence a reduced demand for U. S. products. To the extent that the EFTA Convention does not provide for the development of a common agricultural policy or a common external tariff, U. S. export prospects to this area may not be adversely affected.

Summary and Conclusion

In the course of the 1950's, Europe's economy showed increasing signs of strength and the outlook for the years ahead remains promising. Continuation of the increase in national incomes, exports, and gold and foreign exchange reserves in combination with a moderate rise in population and improved diets, should provide a stimulus for maintaining a strong demand for American agricultural products.

While these factors are trade-creative in nature, a number of developments cast uncertainty on American export prospects. Unfavorable consequences may result from the emergence of regional economic groupings such as the EEC and EFTA. Efforts are currently under way by members of the EEC to formulate a unified agricultural policy with intra-regional self-sufficiency as an objective. Implementation of this objective would involve the adoption of concomitant measures of import regulation and subsidization of domestic producers. Such aspirations, if realized, point toward a reduced demand for certain U. S. agricultural products and generally a shift in Europe from external to internal sources of supply.

The European Common Market

R. W. BARTLETT

IN 1947, WHEN THE INTERNATIONAL Conference of Agricultural Economists met in Totnes, England, people in many European countries were living on a subsistence basis, rationing of foods was common, most industries were at a very low ebb, and several of these countries were near bankruptcy. In sharp contrast, by 1961 when the International Conference met at Cuernavaca, Mexico, European industries were booming, the people were buying more meat, more cars, and more television sets, and they had greatly increased their use of newsprint and electricity. What caused this phenomenal change?

Probably the most important factor has been the intense desire of a continent of skilled workers and able administrators to regain and improve the standard of living that had prevailed before World War II. This desire was implemented by the following:

1. The development of the Marshall Plan, initiated in 1947 and consummated by the United States Congress in 1948, under which over a period of nine years, 19 billion dollars was given to promote the economic development and reconstruction of 18 countries in Western Europe. While the aggregate looks large, funds received from the United States from 1948 to 1957 were only about one-fifth of the cost to this country in 1944 for carrying on World War II.

2. The formation of the Organization for European Cooperation to allocate financial aid made available from the United States and to formulate plans for rebuilding Western Europe. This organization included 17 European nations. Recently it was expanded to include the United States and Canada and named

the "Organization for Economic Cooperation and Development."

3. The European Coal and Steel Community, formed in 1952 for establishing a unified market for coal and steel in Belgium, France, Italy, Luxembourg, Netherlands, and West Germany. Since 1953 tariffs and quota restrictions on these products among the six countries have been abolished and discriminatory transport rates and other frontier barriers have been eliminated. Together these countries in 1960 had an estimated population of 172 million people living in an area of 451,026 square miles. This compared with a United States population of 181 million people living in an area of 3,082,809 square miles.

4. The European Economic Community (the Common Market) through the Treaty of Rome, ratified by the six member countries of the Coal and Steel Community in December, 1957 (Fig. 1). Under this, member countries agreed to abolish tariffs, quotas, and other trade restrictions in a series of steps ending in 1970. The first internal tariff cuts and quotas expansions were made on January 1, 1959. In addition to its internal adjustments, the program called for common external tariffs by 1970.¹

5. The formation of the European Free Trade Area by Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and United Kingdom for gradual elimi-

¹ For most products, external tariffs will be the arithmetic average of existing tariffs, subject to international negotiation with countries outside of the Common Market. For example, before the Common Market, the tariff levied on book-binding machines was 18 percent in Italy, 16 percent in France, 6 percent in the Benelux countries, and 5 percent in Germany. The tariff for the Common Market in 1970 (or earlier) will be the arithmetic average or 11 percent.

nation of tariffs and quotas, effective July 1, 1960. This area includes 493,082 square miles and has a population of 90 million people. Unlike the Common Market countries, EFTA will not establish a common external tariff.

While each of the above programs has contributed to a greater or smaller degree in the improvement in living standards that has taken place in Western

Europe, the remaining part of this discussion will be centered primarily upon the organization and operation of the European Economic Community, referred to as the Common Market, of the six member countries, and of the results already available concerning the operation of the European Coal and Steel Community in these same countries.

The integrated economic activity now



Fig. 1.—The European Common Market and the European Free Trade Area, 1961.

taking place and expanding between Germany and France, along with that of neighboring countries, is one of the most important events since World War II. This activity stands out in sharp contrast to the former divergent policies of France and Germany, which included three wars within the past century (1870, 1914, 1939) and the ending of World War II only 16 years ago.

Organization of the European Common Market

The European Common Market followed to a considerable degree the model of the European Coal and Steel Community. The objectives of organization may be summarized as follows:² (1) removal of customs duties and import and export quotas between each other, (2) establishment of a common tariff and commercial policy for states outside the community, (3) abolition within the community of obstacles to the free movement of persons, services, and capital, (4) inauguration of common agricultural and transport policies, (5) establishment of a system insuring competition, (6) adoption of procedures for coordination of domestic policies and for remedying balance-payments disequilibrium, (7) removal of differences in national laws necessary for operation of the Common Market, (8) creation of a European Social Fund for education and training of displaced workers, (9) establishment of a European Investment Bank to facilitate economic expansion, and (10) association of dependent overseas territories with the community. The supervisory institutions of the Common Market are subordinate to no national government. Under the Rome Treaty of 1957 four main institutions were established: the Assembly, a Court of Justice, a Council

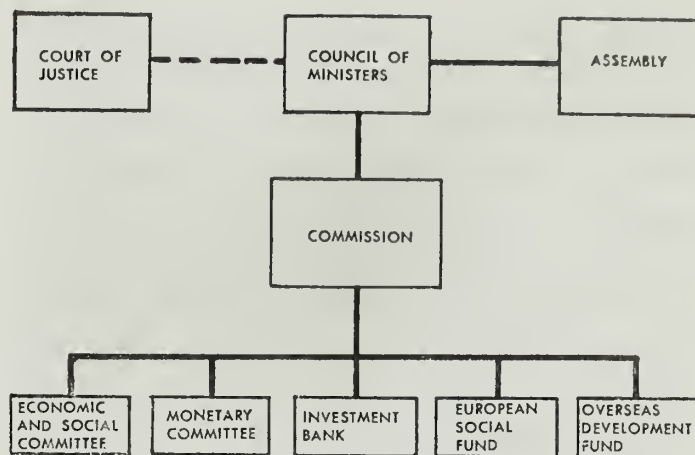


Fig. 2. — Institutions of the Common Market (Court of Justice and Assembly are to be used in common with Euratom and ECCS).

of Ministers, and the Commission (Fig. 2).

The Assembly. The Assembly is the parliament or congress of the Common Market, which also serves Euratom (the Atomic Energy Community) and the European Coal and Steel Community. Its membership consists of 142 delegates, including 36 each from France, Germany, and Italy, 14 each from Belgium and Netherlands, and 6 from Luxembourg. Members represent local and national interests. During its early stages, delegates have been selected by their respective national parliaments. Later it is expected that delegates will be elected directly by the people in each country.

The principal functions of the Assembly are to review proposals of the Council and Commission, approve the budget, and, if desired, by two-thirds majority censure the Commission, which must then resign in a body. Through 1961 there has been no such censure.

The Court of Justice. The Court of Justice consists of seven judges and two advocates general, two each from France, Germany, and Italy, and one each from Belgium, Luxembourg, and Netherlands. Their representation is independent of local or national interests. Members are appointed by agreement among the member states.

² *The European Common Market and its meaning to the United States*, Committee on Economic Development, 1959, p. 92.

The principal functions of the Court are to insure observance of rules of law in interpretation and application of the Rome Treaty; hear cases brought by member states, individuals, or other Common Market organizations; and review legality of decisions by the Council or Commission. Like the Assembly, the Court of Justice serves not only the Common Market but the Coal and Steel Community and Euratom.

The Council of Ministers. The Council of Ministers of the Common Market consists of six members, each representing the broad national interests of his government. Their principal functions are to coordinate policies of member states, formulate general policy for guidance of the Commission, and vote on recommendation of the Commission. To be adopted such recommendations require a unanimous vote during the first two stages of transition to no tariffs.

The Council of Ministers varies from time to time, depending on the specific problem. For example, if the problem concerned employment, training, and movement of workers, social security, and the Social Fund, each country would send as its minister someone familiar with this field. After the Council of Ministers from the six member states had studied the problem and made its recommendations, their tenure as ministers would end. With another problem each member state would send someone familiar with this new problem.

The Commission. The Commission consists of nine members similar to the Court of Justice with two each from France, Germany, and Italy, and one each from Belgium, Luxembourg, and Netherlands. In essence, the Commission is not only the executive agency of the Common Market but in most cases has the sole power to initiate action. The members of the Commission are appointed by common agreement among the

member states for a renewable four-year term.

Unlike the Council of Ministers and the Assembly, which represent local and national interests, the members of the Commission are, in the philosophy of the Rome Treaty, to be international officials who will speak for the Common Market as a whole. The chairman of the Commission, called the president, and two vice-presidents are appointed for a term of two years from among the members. Dr. Walter Hallstein, President of the Commission since 1959, is a distinguished German professor and statesman. Other members of the Commission are also experienced and decisive men.

The principal functions of the Commission are to supervise application of the Treaty, recommend basic issues to the Council of Ministers, and exercise powers conferred by the Council. Five committees serve the Commission: the Economic and Social Committee, the Monetary Committee, the Investment Bank, the European Social Fund, and the Overseas Development Fund (Fig. 2).

Measures of Economic Progress in European Countries

As stated, there has been a surge of economic activity in Europe during the past decade. During this period new institutions, including the European Coal and Steel Community, the European Economic Community (the Common Market), and the European Free Trade Area, have come into being. Results of the programs of these new institutions are being watched by people throughout the world. This report discusses this progress in terms of the following comparisons: (1) changes in the rate of growth in gross national product and in industrial production; (2) changes in per capita production of steel; (3) comparisons of purchasing power; and (4) com-

parisons of the use of automobiles, television sets, radios, telephones, newsprint, and electric power.

Changes in gross national product and industrial production. While the gross national product of the Common Market (162 billion), in 1959 was materially less than that of the United States (482 billion), the rate of growth both in gross national production and in industrial production during the past decade was much faster in the six countries of the Common Market than in either the European Free Trade Area or the United States. The annual rate of growth of the gross national product between 1951 and 1960 was 5.3 percent in the Common Market compared with 3.2 percent for the EFTA and 2.6 percent in the United States (Table 1). Likewise the annual rate of growth in industrial production between 1951 and 1960 was 7.4 percent in the Common Market, compared with 3.6 percent in the EFTA and 3.0 percent

in the United States. The greater increase in growth rates both for gross national product and for industrial production in the Common Market countries may be attributed to: (1) relatively low production in these countries at the beginning of the period; (2) greater acceleration in productivity during this period than in other areas; and (3) breaking down of trade barriers.

Greater differences have existed in rates of growth in production between the different countries than between the groups of countries (Table 1). In the Common Market countries, industrial production between 1951 and 1960 increased fastest in Germany (8.8 percent) and Italy (8.5 percent), while Portugal (7.1 percent) and Austria (6.9 percent) had the fastest rate of growth in the EFTA countries.

Changes in per capita production of steel. In the European Coal and Steel Community, all tariffs and quotas have

Table 1. — Population, Gross National Product, Growth in Gross National Product, and Industrial Production, 1951-1960^a

	Population 1960, est.	Gross national product, 1959	GNP growth rate, 1951-1960	Industrial production growth rate, 1951-1960
		(billions of U.S. dollars)		(percent)
The Common Market				
Germany.....	55,787,000	59.5	7.2	8.8
Italy.....	49,307,000	28.4	5.8	8.5
France.....	45,547,000	52.5	4.2	6.6
Netherlands.....	11,480,000	10.2	5.1	6.0
Luxembourg.....	328,000	.4	2.9	3.5
Belgium.....	9,159,000	11.5	2.6	2.4
Total, Common Market.....	171,608,000	162.5	5.3	7.4
The European Free Trade Area				
Portugal.....	9,124,000	2.2	3.6	7.1
Austria.....	7,076,000	5.2	6.0	6.9
Norway.....	3,589,000	4.2	3.4	5.7
Denmark.....	4,579,000	5.5	3.7	4.4
Sweden.....	7,504,000	11.3	3.8	3.7
United Kingdom.....	52,383,000	66.4	2.7	3.2
Switzerland.....	5,298,000	7.9	5.0	...
Total, European Free Trade Area....	89,553,000	102.7	3.2	3.6
United States.....	180,723,000	482.1	2.6	3.0

^a Adapted from *The New European Market*, The Chase Manhattan Bank, 1961, pp. 38-39.
Sources: UN; OEEC; Economist Intelligence Unit, Ltd.; IMF.

been abolished on coal and steel. While some coal used in these countries is imported, steel for each country is produced within the country. Hence, changes in steel production in each country and region furnish a good standard for measuring changes that have taken place since the elimination of tariffs and quotas.

Studies show that per capita production of steel increased faster in the European Coal and Steel Community (the Common Market) countries between 1951 and 1960 than in the European Free Trade Area or in the United States (Fig. 3). Thus in 1960 production of crude steel in the Common Market averaged 424 kilograms per person, or 78 percent above that for 1951 (238 kilograms) (Fig. 3 and Table 2). In contrast, the 1960 steel production in the European Free Trade Area (361 kilograms) was 63 percent above that of 1951 (221 kilograms), while that for the United States in 1960 (499 kilograms) was 19 percent less than in 1951 (616 kilograms).

Steel production per person in the Common Market increased from 39 percent of that of the United States in 1951 to 85 percent in 1960. By 1960 steel

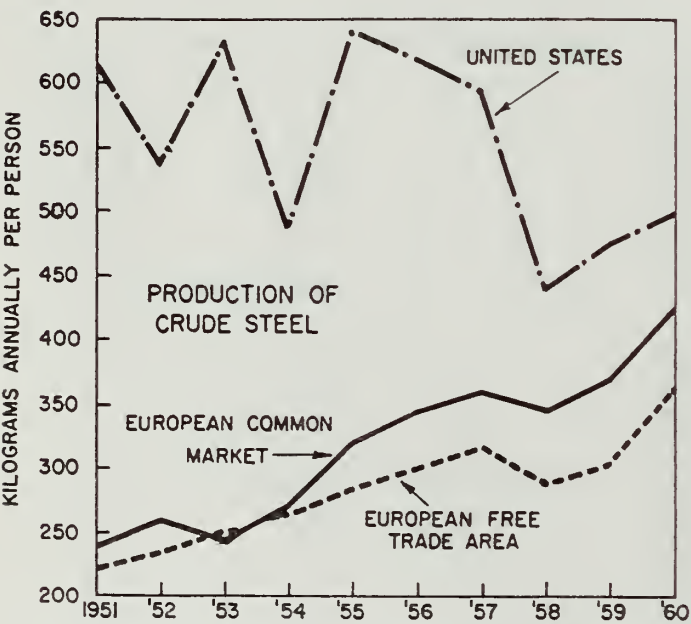


Fig. 3.—Per capita production of crude steel (from industrial statistics of OEEC and UN demographic yearbook).

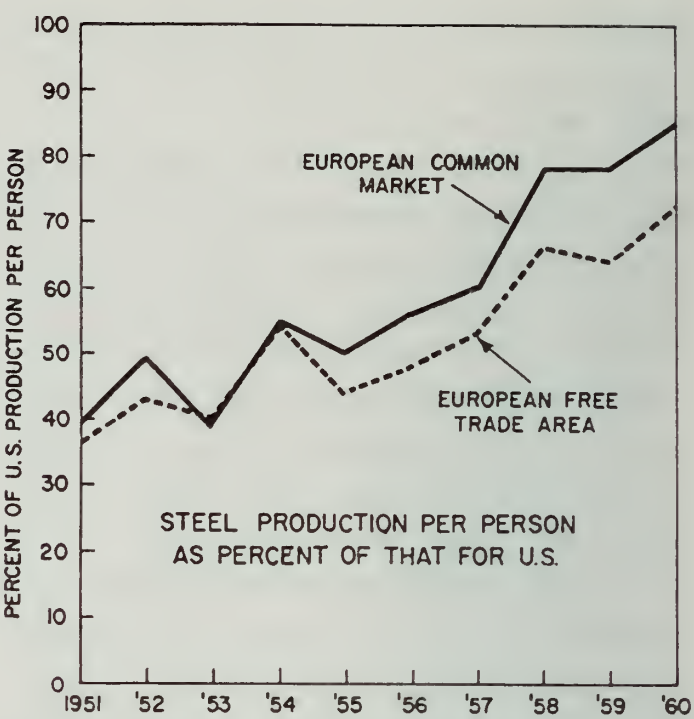


Fig. 4.—How steel production in Common Market and EFTA compares with that for U. S. (from industrial statistics of OEEC and UN demographic yearbook).

production per person in the EFTA countries was 72 percent of that for the United States, compared with 36 percent in 1951. Presumably the elimination of tariffs and quotas between these countries, beginning in 1953, was one factor associated with the greater increase in steel production in the six countries of the Coal and Steel Community (the Common Market).

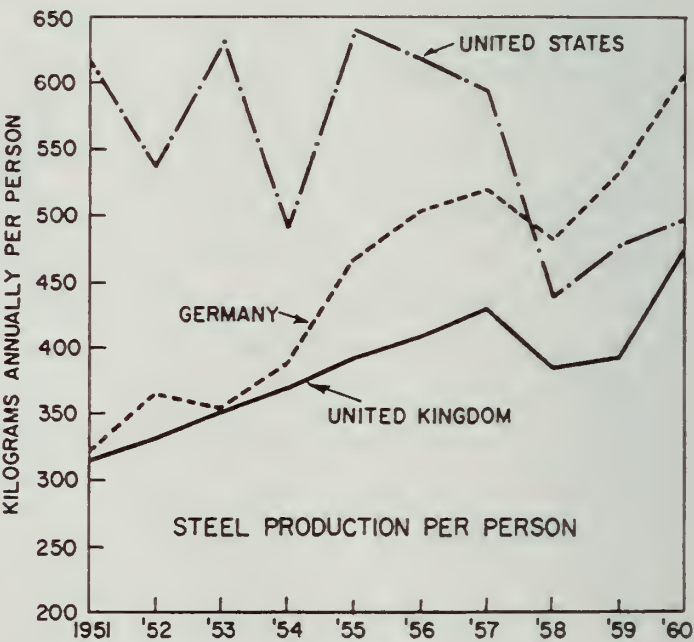


Fig. 5.—Production of crude steel (from industrial statistics of OEEC and UN demographic yearbook).

As with both gross national product and industrial production, the rate of growth in steel production between 1951 and 1960 was higher than that in the United States and in Great Britain (Fig. 5). Part of this greater rate of increase in Germany resulted from low production in 1951 and part from a sharp increase in productivity. Greatly increased productivity in Germany has resulted from use of the most modern methods of producing steel following demolition of most of its older steel plants during World War II.

Purchasing power as related to use of specific products. Purchasing power per person in the different countries is closely related to the standard of living in these countries. In general, the higher

the purchasing power, the greater the number of automobiles, television sets, radios, and telephones, as well as consumption of items such as newsprint and electric power (Table 3). Because of their higher income, people in the United States have purchased more autos, television sets, and radios, have more telephones, and use more newsprint and electric power than any of the countries included in the EEC (Common Market) or EFTA.

While the Common Market countries have witnessed a phenomenal increase in production during the past decade, their purchasing power per person is still below that of the EFTA or of the United States. In 1959 the purchasing power of the Common Market was

Table 2. — Per Capita Production of Crude Steel, the Common Market Countries, European Free Trade Area, and United States, 1951-1960

The Common Market Countries and United States								
Year	Belgium	France	Germany	Italy	Luxembourg	Netherlands	All Common Market	United States
(kilograms annually per person)								
1951.....	588	233	319	66	10,368	58	238	616
1952.....	584	257	366	74	9,967	67	261	536
1953.....	501	234	352	74	8,882	86	246	632
1954.....	567	247	389	88	9,150	85	269	491
1955.....	665	291	468	112	10,356	93	321	640
1956.....	717	307	502	122	11,218	101	345	619
1957.....	701	320	521	140	11,076	109	360	595
1958.....	663	327	484	129	10,625	125	345	442
1959.....	703	338	534	139	11,420	150	372	477
1960.....	782	380	611	166	12,451	169	424	499
The European Free Trade Area								
Year	Austria	Denmark	Norway	Portugal	Sweden	Switzerland	United Kingdom	All EFTA
(kilograms annually per person)								
1951.....	144	37	27	..	212	29	316	221
1952.....	158	42	30	..	238	33	331	233
1953.....	187	41	33	..	251	33	354	250
1954.....	244	45	35	..	250	30	370	264
1955.....	258	54	50	..	289	34	394	283
1956.....	301	54	84	..	328	34	410	300
1957.....	357	58	100	..	339	45	428	317
1958.....	342	58	105	..	324	46	385	290
1959.....	355	64	118	..	389	48	394	303
1960.....	446	76 ^a	134	..	430	57 ^a	475	361

^a Estimated.

Source: Industrial statistics of OEEC.

Table 3. — Purchasing Power of Gross National Product as Related to Specific Items, Common Market Countries, European Free Trade Area, and United States, 1959 or 1960^a

Country	Per capita gross national product, 1959 ^b	Auto-mobiles per 1,000 population, 1960	TV sets per 1,000 population, 1960	Radios per 1,000 population, 1959	Tele-phones per 1,000 population, 1960	Newsprint consumption, 1959 (kg. per person)	Electric power consumption, 1960 (kwh. per person)
Luxembourg.....	\$1,543	...	18	293	144	...	3,049
Sweden.....	1,512	158	108	351	354	23.1	4,531
United Kingdom.....	1,495	106	209	287	151	22.1	2,482
Switzerland.....	1,486	96	20	262	298	14.1	3,398
Norway.....	1,479	59	5	289	194	9.8	864
Denmark.....	1,421	88	87	328	224	18.3	1,092
Germany.....	1,418	85	76	287	101	8.6	2,026
France.....	1,395	109	33	238	91	10.6	1,537
Belgium.....	1,393	87 ^c	44	272	119	10.9 ^c	1,528
Netherlands.....	1,262	47	61	271	132	12.2	1,394
Austria.....	1,243	58	21	274	93	11.2	1,978
Italy.....	871	41	37	123	72	4.9	1,095
Portugal.....	471	17	4	85	40	2.6	329
The Common Market..	1,239	76	50	225	93	8.3	1,556
European Free Trade Area.....	1,367	94	142	271	166	17.8	2,624
United States.....	2,698	339	297	948	397	36.0	4,676

^a Adapted from *The New European Market*, The Chase Manhattan Bank, 1961, pp. 48-49.
^b Gross national product adjusted to reflect purchasing power of national currencies.
^c Including Luxembourg.
Sources: OEEC, UN, *The American Automobile*, *TV Factbook*, *American Telephone and Telegraph Company*.

\$1,239 per person as compared with \$1,367 for the EFTA and \$2,698 in the United States.

Measured in physical terms, the standard of living of the Common Market countries is also below that of other areas. Thus in 1960 there were 76 automobiles per 1,000 people in Common Market countries compared with 94 in the EFTA and 339 in the United States. The per capita consumption of electric power in the EFTA in 1960 (2,624 kwh) was 68 percent above that for the Common Market countries (1,556 kwh), and over half that of the United States (4,676 kwh). Similar differences existed in 1959 or 1960 for the number of television sets, radios, and telephones and consumption of newsprint.

In 1959 the purchasing power in Sweden ranked second only to Luxembourg (Table 3). Among the six consumption measures used, Sweden ranked first in automobiles, radios, telephones, and newsprint and electric power con-

sumption and second in television sets among the 13 European countries. Portugal, with its relatively low purchasing power, ranked the lowest in each of the measures of consumption.

Communism and Improved Standards of Living

One of the byproducts of improved standards of living in Western Europe has been the disappearance of Communism as a dangerous internal force. Evidence of this is found in the sharp decline in the Communist vote in recent years. Following World War II, Communism was strongest in France and Italy. In 1947 the Communist vote in France was 25 percent of the total vote. By 1958 this had declined to 19 percent. In Italy the Communist party is still strong, as shown by the 23 percent of the total number of votes it received in 1958. This proportion, however, was substantially less than the 31 percent received ten years earlier. In Belgium the Communist vote declined

from 7.5 percent in 1948 to 2 percent in 1958. The Communist vote in the Netherlands in 1959 was 3 percent, or half that of 1952 (6 percent). In Germany the Communist vote in 1953 was 2.2 percent of the total. Between 1953 and 1957 Communism in Germany was ruled unconstitutional.

Continuation of the upward surge in purchasing power of the countries in Western Europe may be expected to reduce still further the Communist vote in these countries.

Summary

Marshall Plan funds paid by the United States to 18 European countries over a period of nine years beginning in 1948 helped these countries to get back into industrial production following World War II.

Partly as a result of Marshall Plan funds, the European Coal and Steel Community, consisting of Belgium, France, Italy, Luxembourg, Netherlands, and West Germany, came into being in 1952. This organization has broken down all trade barriers and eliminated quotas and other restrictions between these countries for coal and steel.

Partly as a result of breaking down of trade barriers, steel production per person in the six countries increased much faster between 1951 and 1960 than in other European countries. From 1958 to 1960 steel production per person in Germany was higher than that of either the United States or the United Kingdom.

Partly as a result of the successful operation of the Coal and Steel Community, in 1957 the six countries included in this Community ratified a treaty in Rome in which they agreed to break down all trade barriers between themselves in a series of steps ending in 1970. This treaty set up a European Economic

Community — the Common Market — similar to the Coal and Steel Community. Four institutions established under the new organization were an Assembly, Council of Ministers, Court of Justice, and a Commission. These institutions constitute a supranational authority with adequate representation for each member country.

The rate of growth in productivity both of gross national product and industrial production increased much more rapidly in the European Common Market countries than in European countries not under this organization. In 1960 this led to the formation of the European Free Trade Area consisting of Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom. The purpose of this organization was to lower tariffs and eliminate quotas, but unlike the Common Market, no attempt was to be made to have a common tariff for goods imported.

As a byproduct of improved living standards, there has been a sharp drop in the Communist vote in Europe since World War II. In Italy the Communist vote decreased from 31 percent in 1948 to 23 percent in 1958, and in France from 25 percent in 1948 to 19 percent in 1958. Similar decreases in the Communist vote took place for other European countries.

Conclusions

From the long-run viewpoint, the economic integration of six countries in the Common Market, which in turn is bringing about materially higher standards of living, is one of the most important events since World War II. Increased production and income of these countries mean better markets for some products produced in the United States. The demand for American products by the six European countries increased from 1.6

billion dollars in 1953 to 2.6 billion dollars in 1960. With further integration and expansion of production and income, it may be expected that the demand for certain American products will continue to increase: tobacco, oilseeds, cotton, and materials such as copper and steel scrap. On the other hand, as common external tariffs are initiated, one may also expect that the demand for some American products will decrease: wheat, fruits, vegetables, poultry, dairy products, and manufactures such as chemicals, textiles, and electrical equipment. On an over-all basis, however, it may be expected that losses in sales of specific products will be far more than offset by increased sales of others.

The United Kingdom has already begun negotiations to become a member of the Common Market. If it is admitted, it is probable that Denmark and Norway will also seek admittance. If the United Kingdom, Denmark, and Norway become members of the Common Market, it is probable that Austria, Sweden, Switzerland, and possibly Portugal will

seek admission as associate members. Assuming that economic integration now in process for the six Common Market countries expands to the 13 countries, the gross national product of this new economy eventually may equal or exceed that of the United States.

From a historical viewpoint, it is almost unbelievable that after three wars in a century, one of which ended only 16 years ago, France and Germany, along with other countries, have begun to work together as an economic unit. The United States and Canada are closely allied to Western Europe economically, militarily, and culturally. This is recognized in the Organization for Economic Cooperation and Development, which now includes the principal European countries, the United States, and Canada, and in the North Atlantic Treaty Organization. Hence, while the act is still a long way from the blueprint stage, it is not impossible that both the United States and Canada may find it to their economic advantage eventually to become members of the Common Market.

Consumers' Egg Preferences and Their Relationship to United States Quality Standards

R. K. NOLES and J. R. ROUSH

A GOOD QUALITY STANDARD for any product should be built on characteristics that users of the product recognize and consider important. When the standard meets these criteria, consumers can indicate more accurately to producers the quality desired. Consumers do this through the prices they are willing to pay for the various qualities of the product offered on the market.

In 1923 the U.S. Department of Agriculture began developing standards for quality of shell eggs. These standards were introduced in tentative form and sent out to the trade in 1925. Although the standards have been revised periodically, the current standards are basically the same as those originally proposed. This article summarizes the findings of a study which had the major objective of determining whether these U.S. standards for interior egg quality describe differences in egg characteristics that consumers recognize and feel are important. The study also provided information on the consumers' sources of egg supply and the quality of eggs being used in the home.

Research Procedure

The households in the cities of Champaign-Urbana, Illinois, and the adjacent residential areas constituted the population for the study. This area contained 19,900 households with a total population of 76,900 persons. The effective annual buying income per household in 1959 was \$9,047, or \$2,298 per capita. A random sample of 117 of these households was selected for study. The 117 housewives were interviewed in their homes during the summer of 1959.

During the interview procedure, the enumerator broke seven eggs into flat glass dishes displayed on a white background. Three of these eggs were supplied by the housewife being interviewed, and provided a means of determining the type of egg being used in the home. The enumerator furnished the other four eggs. This procedure assured the introduction of variation in the quality of eggs viewed by the housewife.

The housewife viewed the seven eggs individually. After observing each egg she was asked to record her opinion of the egg by rating it on a nine-point hedonic rating scale. The rating could vary from "like extremely" to "dislike extremely" (the terms used are given in Table 2). By numbering these terms from 9 through 1, they were used in measuring the housewife's reaction to the types of eggs viewed.

Since different eggs were used in each household, it was necessary for the enumerator to record the quality characteristics of each egg rated by each housewife. A classification system was developed for each of the characteristics that housewives might identify in the survey. This procedure allowed the determination of an average rating of all housewives for eggs which were quite homogeneous with respect to all interior quality characteristics.

The enumerator used Haugh units to classify eggs according to albumen quality. This method considers albumen height in relation to egg weight. A color chart was used to classify yolk color. The extent of germ development, the degree of yolk mottling, the prominence of the chalazae (twisted ends of

a membrane enclosing the yolk), and the presence of blood spots, meat spots, and any foreign matter were all recorded by the enumerator for each egg rated by the housewives.

Once the individual eggs had been rated by the housewife, the broken-out eggs were placed in pairs for further comparison. In pairing the eggs, the enumerator paired one that the housewife had given a high rating with one that she had rated low. The housewife was then asked how the two eggs differed. From the response to this question, information was obtained on characteristics used by the housewives in evaluating interior egg quality. Whenever the housewives made any comment concerning a characteristic, this comment was recorded and included in the summary as evidence that this characteristic had been observed by the housewife.

Egg Characteristics Identified by Consumers

The fact that the housewife mentioned a characteristic at some time during the interview did not indicate that she considered it important. It only served to indicate that she was aware that eggs

differed with respect to this characteristic, and that she was able, at least in a general way, to recognize differences in this characteristic between eggs.

Of the various interior egg quality characteristics recognized by the housewives, yolk color was mentioned most frequently (Table 1). The frequency with which yolk color was mentioned can be partly traced to the wide range of yolk characteristics that comments on yolk color may have covered. A comment on yolk color may have referred to color shade, to the presence or absence of yolk mottling, or to the extent of germ development. Since it was often impossible to determine which of these characteristics had been referred to, they were all combined under yolk color.

Height or firmness of the albumen was mentioned by more than four-fifths of the housewives. The height of the yolk and the presence or absence of blood spots were other interior egg characteristics mentioned by more than half of the housewives. At some point during the enumeration, almost half of the housewives made comments regarding the chalazae.

Ratings of eggs containing no in-

Table 1. — Interior Egg Quality Characteristics Mentioned by Housewives

Characteristic	Percent mentioning
Color of yolk.....	92.3 ^a
Height of albumen.	81.2
Height of yolk.....	69.2
Blood spots.....	55.6
Chalazae.....	44.4
Odor.....	26.5
Size.....	17.9
Other.....	9.4

^a Included comments on yolk color, yolk mottling, and germ spots.

Table 2. — Ratings by Housewives of Eggs of Various Qualities Containing No Interior Defects

Classification	Numerical classifi- cation	Quality based on Haugh scores			Total
		A	B	C	
(percent of eggs)					
Like extremely.....	9	8.2	8.3	3.6	7.2
Like very much.....	8	32.3	24.3	9.5	24.4
Like moderately.....	7	31.7	29.2	20.2	28.2
Like slightly.....	6	12.0	12.5	8.3	11.4
Neither like nor dislike....	5	3.8	3.4	4.8	3.9
Dislike slightly.....	4	9.5	15.3	15.5	13.0
Dislike moderately.....	3	0.6	4.2	14.3	4.9
Dislike very much.....	2	1.3	2.1	16.7	4.9
Dislike extremely.....	1	0.6	0.7	7.1	2.1
Total.....		100.0	100.0	100.0	100.0
Average Haugh score.....		66.06	44.39	16.58	
Average rating.....		6.880	6.444	4.690	
Standard error.....		.124	.153	.257	

terior defects. The ratings that housewives gave to eggs having no internal defects were separated for analysis. Eggs removed from the analysis were those containing blood and meat spots, germ development, and discolorations of any type in the albumen or yolk. The eggs included in the analysis varied in size, yolk color, amount of chalazae, and height of the albumen. According to variations in the albumen height, these eggs were classified as A, B, or C quality eggs by the enumerator. Classification of the eggs in this manner essentially agreed with the U.S. standards for interior quality. The only differences were that the established standards allow yolk mottling in the lower qualities and small blood spots in the C quality eggs.

The housewives rated the A quality eggs higher than the B quality eggs and the B quality eggs higher than the C quality eggs (Table 2). The differences in these ratings were significant at the 5-percent level. A rather larger number of eggs in each quality classification were rated "like moderately" or higher. More than one-eighth of the C quality eggs were rated "like very much" or "like extremely." Thus although housewives generally preferred A quality to B quality eggs and B quality to C quality eggs, some housewives found B and C quality eggs without defects as acceptable as or more acceptable than A quality eggs.

To classify as A quality eggs under the Haugh system, eggs must measure 55 Haugh units or more. B quality eggs are from 31 to 55 units. There are fairly wide variations in albumen height within a given quality. To further refine the housewives' reactions to albumen height, the eggs without internal defects were arrayed into classes with intervals of 10 Haugh units and the average ratings of eggs falling into each class were compared. As the Haugh units increased, the average rating by the housewives

Table 3. — Relationship Between Housewives' Ratings and Haugh Units for Eggs Containing No Interior Defects

Haugh score	Number of eggs	Average Haugh score	Average rating	Standard error
9 or less . . .	21	3.81	4.048	.495
10-19	23	14.22	4.174	.506
20-29	37	24.23	5.378	.384
30-39	43	34.37	6.279	.279
40-49	62	45.40	6.371	.250
50-59	82	54.50	6.732	.190
60-69	72	63.90	6.833	.177
70 or more	46	77.30	6.957	.222

increased (Table 3). The height or firmness of the egg albumen is an important criterion in the U.S. standards for egg quality. This factor appeared to be important also to the housewives in this study.

Rating of eggs containing interior defects. The housewives rated a total of 776 eggs. Of this total, 390 contained some kind of internal defect. These eggs with internal defects were subdivided into three categories by the enumerator on the basis of the type and severity of the defect. Eggs containing mottled yolks, other discolorations, or foreign matter that was evident but not conspicuous were classified as having "slight defects." Eggs containing mottled yolks, other discolorations, or foreign material so prominent that a person with normal vision would be expected to distinguish the defect readily were classified as having "moderate to heavy defects." The third classification contained eggs having blood or meat spots. Eggs in each of the three categories were further classified as to their Haugh scores. According to the albumen height, they were divided into A, B, and C quality. This latter classification obviously ignored the interior defects.

Defects in the eggs were influential in determining the ratings given the eggs by the housewives. Eggs with albumen characteristics of A quality but with

slight defects were rated significantly lower than eggs with albumen characteristics of A quality and containing no defects (Table 4). Eggs with albumen characteristics of B quality but with slight defects were rated significantly lower than eggs with B quality albumen characteristics and containing no defects.

The height or firmness of the albumen did not influence the ratings of those eggs having moderate to heavy defects. Regardless of their albumen characteristics, eggs with these major defects were rated about the same as eggs with C quality albumen characteristics in the "no defects" or "slight defects" categories (Table 4). Once albumen char-

acteristics had reduced the egg to C quality, the egg could apparently become no worse to the housewives by the addition of heavy yolk mottling or even blood spots.

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Table 4. — Housewives' Ratings of All Eggs, by Type and Prominence of Defect

Haugh score quality ^a	Number of eggs	Average Haugh score	Average housewife rating	Standard error
No defects				
A.....	158	66.06	6.880	.124
B.....	144	44.39	6.444	.153
C.....	84	16.58	4.690	.257
Slight defects ^b				
A.....	81	64.16	6.269	.207
B.....	112	43.04	5.938	.195
C.....	70	19.14	5.071	.254
Moderate to heavy defects ^c				
A.....	16	64.69	4.500	.466
B.....	23	42.70	4.349	.514
C.....	25	16.00	5.000	.455
Blood and meat spots				
A.....	28	63.79	5.893	.440
B.....	19	46.32	4.789	.514
C.....	16	18.12	3.500	.455

^a Defects ignored in making these quality classifications.
^b Defects evident but not conspicuous.
^c Defects prominent.

quality eggs with slight chalazae were not rated significantly higher than A quality eggs with normal chalazae. For B and C quality eggs, even those eggs with moderate to heavy chalazae were not rated significantly lower than those eggs with normal or slight chalazae. One can conclude that the effect of the chalazae on housewives' ratings was of less importance than the effect of yolk mottling and blood spots.

Influence of yolk color on ratings. More than 90 percent of the housewives made some comment regarding yolk color during the enumeration. However, many of these color comments were associated not with the shade of the yolk but with the presence of yolk mottling or germ spots. Only 30 percent of the housewives made such comments as "too pale" or "too dark," indicating specifically that it was the shade of yolk color which was being considered. The U.S. standards do not consider the lightness or darkness of the yolk as a factor in egg quality determination.

Of the housewives commenting that the yolk was "too pale," the yolks being observed were a very light yellow to a creamy white. Some considered yolks that were showing hues of brown or red as "too dark." However, other housewives indicated that these darker yolks were "richer" or had a "better flavor." In general a wide range of color ratings seemed acceptable. This range might best be described as colors from lemon yellow to orange yellow. On the Heiman-Carter yolk color rotor, the numbers from 10 through 19 represent this range.

Yolk-color ratings made by the enumerator were correlated with ratings given the eggs by the housewives. Eggs used in this analysis contained no blood or meat spots, discolorations, or heavy chalazae. The correlation coefficient for A quality eggs was 0.1709. For B and C

quality eggs the correlation coefficients were -0.0479 and -0.0465 , respectively. This indicates that the yolk color of the eggs observed did not affect the housewives' ratings of these eggs.

Source of Eggs

Approximately half of the eggs purchased by the housewives in this study were obtained from grocery stores. Most of the other eggs came from farmer peddlers or individuals who were believed by the housewives to be farmer peddlers. The housewives indicated that they considered convenience, quality, or price, or a combination of these items in selecting their source of eggs. For the housewives buying eggs in stores or having eggs delivered, convenience appeared to be a major criterion. Among those purchasing eggs from farmers, there was a general belief that these eggs were "better" or "fresher." Some of the housewives who bought eggs from farmers felt that these eggs were cheaper, while others felt that they were more expensive.

Quality of Eggs Used by Housewives

The research procedure was set up in such a way that three eggs used in the ratings were to come from the supply of eggs in the home. This procedure allowed an analysis of the quality of eggs being used in the home. In general, the quality of eggs found in the homes was poor. Considering exterior as well as interior characteristics, only 26 percent of these eggs met the U.S. standards for A quality. The eggs, of course, may have deteriorated in quality from the time of purchase to the time of the interview.

The primary reason for eggs falling into the B and C quality classification was low albumen height. Only 41 percent of the eggs secured from the house-

wives would have qualified as A quality or better according to albumen height. Yolk mottling in some of these eggs reduced the interior quality. Of the total eggs examined from supplies in the homes, 25.9 percent were A quality or better, 43.5 percent were B quality, 18.5 percent were C quality, 8.3 percent were dirt, 3.5 percent were bloods, and 0.3 percent rots.

Although the eggs found in the homes were of rather poor quality as measured by U.S. standards, housewives generally indicated that they were satisfied with the eggs they were receiving. The primary complaint was about blood spots although "flat," "old," or "watery" eggs were mentioned. Although the housewives appeared satisfied with the eggs they were receiving, they expressed belief that they were not the very best but were as good as from other sources.

Summary

Data obtained from a random sample of housewives in Champaign-Urbana indicated that most of these consumers differentiated eggs according to the firmness and height of the yolk and albumen and used these factors as a criterion in evaluating the quality of eggs. These housewives also recognized yolk mottling, germ development, and blood spots as undesirable. Although the housewives frequently noted chalazae in the eggs, they generally objected to chalazae only when found in large amounts in A quality eggs. Yolk color did not affect the housewives' ratings of the eggs seen. Housewives generally ordered their preferences

for egg characteristics as they are ordered in the U.S. standards for interior quality.

Approximately half of the housewives purchased their eggs from grocery stores, while most of the other eggs came from farmer peddlers or those who were believed to be farmer peddlers. Convenience, quality, and price appeared to be the three major reasons for securing eggs from a given source.

Only 26 percent of the eggs found in the homes were of A quality or better at the time of the interview. Nevertheless, the housewives generally indicated that they were satisfied with the eggs they were receiving.

Although some housewives did not rate eggs well according to U.S. standards, many others did rather well in rating the eggs. For eggs without interior defects, the housewives as a group rated the A quality eggs significantly higher than the B quality and the B quality significantly higher than the C quality. For eggs with defects, housewives ranked the eggs inversely to the prominence of the defect. This is consistent with the ranking of these characteristics in the U.S. standards.

This study provided evidence that egg quality as specified by U.S. standards is closely related to consumer preferences for egg characteristics. It appears that consumers do recognize the characteristics at present considered in the U.S. standards for interior egg quality. Furthermore, they order these characteristics in the same general manner as the characteristics are ordered in the U.S. standards.

Adjustments on Illinois Grain Farms in the Fifties

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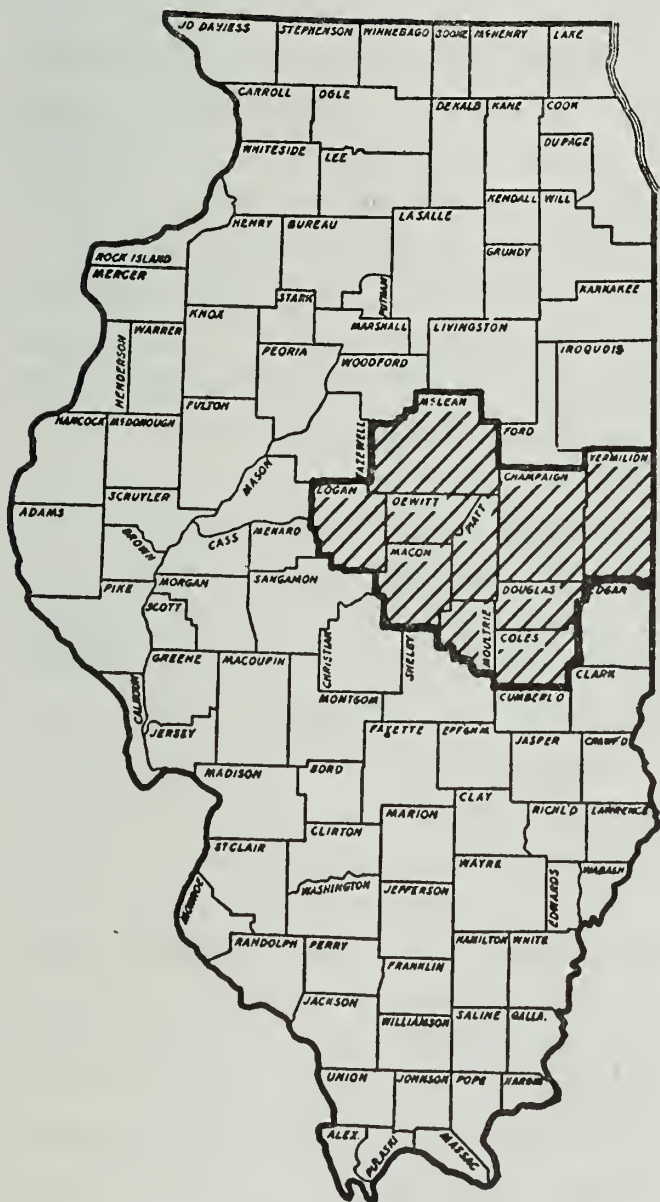
THE DECADE OF THE 1950's WAS a period of rapid change in Illinois agriculture. The number of farms dropped by more than 40,000 from 1950 to 1959, and farm population declined by about one-fourth. Census and other secondary data testify to general changes such as increasing sizes and declining numbers of farms, improved technologies, higher yields, and the tendency toward specialization in both crop and livestock production. But few intensive studies of the changes occurring on particular types of farms have been made. This is a report of a study of this type.

Objectives and Scope

The general objective of this study was to determine the adjustments that selected farmers in east-central Illinois made in their farm businesses during the period 1951 through 1959. Specific objectives were:

1. To determine the nature and extent of farm adjustments in resource use, output, and income.
2. To determine whether there were differences in the adjustments made among farms with different amounts of resources at the beginning of the 1951-1959 period.

The study was limited to 109 farms in ten counties of east-central Illinois, located on soils with productivity ratings² of 80 or above and ranging in size from 140 to 700 acres in 1951. The operators of these farms were cooperators in the Illinois Farm Bureau Farm Management Service for the nine-year period and kept farm financial and production records, which served as the source of data for this study. Inasmuch as this was a study of farmers who farmed throughout the nine-year period from 1951 through 1959, the results offer only a partial view of the processes of farm adjustment. This study does not reflect adjustments in farming



Area where farms studied were located.

¹ This is a summary of a thesis, "Resource Adjustment on Selected East-Central Illinois Farms, 1951-1959," submitted by Mr. Penningroth in partial fulfillment of the requirements for the degree of Master of Science in Agricultural Economics, University of Illinois Graduate College. Professors Thompson and Mueller supervised the research.

² Illinois soils are rated on a scale of 5 to 100 with the most productive soils assigned an index of 100. See H. L. Wascher *et al.*, "Illinois Soil Type Descriptions," AG-1443, Department of Agronomy, University of Illinois Agricultural Experiment Station.

that result from farmers entering or leaving the farming business.

In general, the farms were larger than the average for the state and for the ten-county area, and the incomes derived from them were larger than the average Illinois farm income. Although the sample was not representative of the average for the area, it represented a significant segment of commercial grain farms in the area. There was considerable range within the sample in acres per farm, income, and managerial level. The one-third of the farms with the smallest size of business in 1951-1952 were rather typical of the average farm in the ten-county area in size of farm and acres of important crops.

Method of Analysis

Comparative graphic and tabular analysis was the primary method employed. Annual input and output items were compared between the averages of the first two and last two years, 1951-1952 and 1958-1959.

A number of farm characteristics, such as acres per farm and acres of crops, are readily measured in physical amounts, so changes are relatively easy to identify. Other farm changes, however, such as changes in capital resources and gross and net returns, are most easily measured in monetary values that reflect changes in both amounts and prices of resources and products. Dollar figures were therefore adjusted to a constant price level (1947-1949) to permit comparison of physical changes on groups of farms.

In order to test the hypothesis that there were differences in the adjustments on farms with different amounts of resources, subsamples based upon size of business were analyzed. "Total nonfeed inputs" was selected as the measure of the amount of resources or size of the

farm business. The total sample of 109 farms was divided into thirds, so the adjustments on the 36 farms with the largest size of business at the beginning of the period could be compared with the adjustments on the 36 farms with the smallest size of business. Once a farm was placed in a given size group in 1951-1952, it was kept in that group throughout the period through 1959.

The 1951-1959 Period

The significance of economic pressures for change at any time depends in part on the income and living levels provided and expectations created during previous years. The nine-year period of this study followed the decade of the 1940's, which was dominated by World War II and postwar influences, a decade of relatively favorable price-cost relationships for farmers. The 1951-1959 period was one of declining farm prices, stable costs in the early part of the period, and increasing costs in the latter part of the period. Prices of farm products declined about 20 percent, and the parity ratio declined from 107 in 1951 to 80 in 1959, averaging 89 for the period.

Changes in Farm Organization

Farm size and tenure. The average size of the 109 farms increased from 287 acres in 1951-1952 to 321 acres in 1958-1959, or 34 acres (Table 1). Fifty of the 109 farms increased in size, 49 remained the same size, and 10 decreased in size. When land was added to a farm business, the size was frequently increased by 40 acres or more. However, because a relatively small number of farms were enlarged in a given year, the average size increased slowly and gradually.

The farms were predominantly tenant-operated throughout the nine-year period. In 1951, 8 farms were owned, 25 farms were partly owned and partly

Table 1. — Changes in Farm Organization, 109 East-Central Illinois Farms

	1951-1952	1958-1959	Change	Per- centage change
Owned acres.....	44.4	67.6	23.2	52.3
Rented acres.....	242.8	253.7	10.9	4.5
Total acres.....	287.2	321.3	34.1	11.9
Acres in crops				
Corn.....	107.1	126.0	18.9	17.6
Soybeans.....	47.7	87.9	40.2	84.3
Corn and soybeans.....	154.8	213.9	59.1	38.2
Oats.....	43.6	32.9	-10.7	-24.5
Wheat.....	17.4	21.3	3.9	22.4
Hay and pasture.....	51.9	33.9	-18.0	-33.9
Crop yields per acre				
Corn.....	72.0	87.0	15.0	20.8
Soybeans.....	31.0	31.7	.7	2.3
Oats.....	44.2	53.8	9.6	21.7
Wheat.....	27.0	37.2	10.2	37.8
Livestock				
Litters of pigs.....	16.2	19.7	3.5	21.6
Beef produced, lb.....	10,623	12,654	2,031	19.1
Hens.....	79	86	7	8.9
Sheep, animal units.....	.6	1.3	.7	116.7
Dairy cows.....	4.0	2.5	-1.5	-37.5
Beef cows.....	4.7	3.9	-.8	-17.0
Months of labor				
Operator's.....	11.9	11.9	....	....
Family.....	1.8	1.4	-.4	-22.2
Hired.....	6.6	6.6	....	....
Total.....	20.3	19.9	-.4	-2.0

rented, and 76 were wholly rented. In 1959, 7 farms were owned, as one of the full owners in 1951 was renting additional land in 1959, 40 farms were partly owned, and 62 farms were wholly rented. Although there was an increase of more than 50 percent in average acres owned, about four-fifths of the farmland was rented and one-fifth owned in 1959.

Land use and crop yields. Changes in land use and crop yields were among the important adjustments made on the farms studied (Table 1). The average acres of corn, soybeans, and wheat increased because of a combination of increased size of farms and more intensive land use. Seventy percent of the tillable land was in corn and soybeans in 1958-1959, an increase from 58 percent in 1951-1952. The average hay and pasture

acreage decreased by one-third in spite of a 12-percent increase in farm size. The shift in land use was gradual except for a sharp increase in corn acreage and a reduction in soybean acreage from 1958 to 1959, coinciding with the discontinuance of corn allotments for 1959.

Average yields of corn, oats, and wheat increased substantially from 1951-1952 to 1958-1959, but soybean yields changed little. Corn and oat yields increased by one-fifth and wheat yields by nearly two-fifths. Soybean yields showed less year-to-year variability than yields of corn, oats, and wheat.

Livestock production. Grain farms were the predominant type in the group of 109 farms, but on a number of farms livestock enterprises, particularly hogs and feeder cattle, were im-

portant. About one-fourth of the crops produced on all farms was fed to livestock. Hogs and feeder cattle increased about one-fifth between 1951-1952 and 1958-1959. There was a definite tendency for these enterprises to be concentrated on fewer farms toward the end of the period, confirming the generally recognized trend to specialization in livestock production. Poultry, sheep, dairy, and beef cow herd enterprises were of minor importance on the group of farms, although each of these enterprises made a

significant contribution to income on some farms.

Labor. The labor supply remained relatively constant during the nine-year period even though farm size, crop yields, and livestock production increased. The average labor supply was 12 months of labor supplied by the operator, 1 to 2 months of family labor, and 6 to 7 months of hired labor. Operator labor and hired labor were the same in 1958-1959 as in 1951-1952, but family labor declined.

Table 2. — Changes in Investment, Costs, and Returns

	1951-1952	1958-1959	Change	Per-centage change
Investments				
Land.....	\$ 93,951	\$139,835	\$ 45,884	48.8
Buildings.....	12,566	13,190	624	5.0
Soil fertility.....	914	740	-174	-19.0
Machinery.....	6,667	7,380	713	10.7
Auto (farm share).....	904	1,036	132	14.6
Grain and livestock.....	19,153	21,655	2,502	13.0
Total investment.....	\$134,155	\$183,836	\$ 49,681	37.0
Annual inputs				
Soil fertility.....	\$ 1,102	\$ 1,996	\$ 894	81.1
Buildings and fence.....	1,045	1,409	364	34.8
Machinery and equipment.....	4,366	5,972	1,606	36.8
Labor.....	3,514	4,242	728	20.7
Property taxes.....	1,132	1,945	813	71.8
Seed and crop expense.....	676	892	216	32.0
Capital charge on investment.....	5,772	7,786	2,014	34.9
Miscellaneous.....	368	542	174	47.3
Total nonfeed inputs.....	\$ 17,975	\$ 24,784	\$ 6,809	37.9
Annual returns				
Livestock returns.....	\$ 9,577	\$ 9,834	\$ 257	2.7
Less feed inputs.....	7,514	6,908	-606	-8.1
Livestock returns above feed inputs.....	2,063	2,926	863	41.8
Feed and grain returns.....	20,612	21,306	694	3.4
Other cash income.....	560	880	320	57.1
Total value of farm production.....	\$ 23,235	\$ 25,112	\$ 1,877	8.1
Management returns.....	\$ 5,260	\$ 328	\$-4,932	-93.8
Farm and family earnings, total farm.....	13,345	10,888	-2,457	-18.4
Farm and family earnings, operator ^a	7,198	5,749	-1,449	-20.1
Costs and returns per tillable acre				
Soil fertility.....	\$ 4.10	\$ 6.57	\$ 2.47	60.2
Machinery and equipment.....	16.24	19.66	3.42	21.1
Labor.....	13.07	13.96	.89	6.8
Value of farm production.....	86.44	82.66	-3.78	-4.4
Nonfeed costs.....	66.87	81.58	14.71	22.0
Management returns.....	19.57	1.08	-18.49	-94.5
Farm production per \$1.00 nonfeed costs.....	\$ 1.29	\$ 1.01	\$ -.28	-21.7

^a Includes all farm and family earnings on owned farms, and the operator's share on part owned and rented farms.

Changes in Investments, Costs, and Returns in Current Dollars

Farm investments. The average investment on the 109 farms increased from \$134,155 in 1951-1952 to \$183,836 in 1958-1959, an increase of 37 percent (Table 2). Over 90 percent of the change in investment reflected increases in amount and value of land. Of the increase in land investment, about one-fourth was due to the increase in size of farms and about three-fourths to increased land value. Land was valued at an average of \$327 an acre in 1951-1952 and \$435 in 1958-1959. The decline in investment in soil fertility, mainly limestone and rock phosphate, reflects the movement toward more soluble sources of phosphorus and a slowdown in application of limestone.

Resource inputs. The annual resource inputs, valued in current dollars, increased 38 percent on the 109 farms (Table 2). These changes were due to a combination of changes in physical quantities and changes in prices paid. The annual cost of soil fertility increased 81 percent from 1951-1952 to 1958-1959 and property taxes increased 72 percent. Labor cost increased about one-fifth and most other input items increased about one-third. Fertilizer costs and machinery and equipment costs per tillable acre increased 60 and 21 percent, respectively. Labor costs per tillable acre increased 7 percent from 1951-1952 to 1958-1959.

Production value and returns. The total value of farm production increased from \$23,235 per farm in 1951-1952 to \$25,112 in 1958-1959, an increase of 8 percent (Table 2). As was true for costs, this change in value reflects changes in price as well as in quantity. The increase of \$1,877 in value of farm production was made up of the following increases: \$863 in livestock returns above feed

costs, \$694 in feed and grain returns, and \$320 in other cash income.

The combination of farm adjustments and changing price levels led to a net result of a change in returns to management from \$5,260 in 1951-1952 to \$328 in 1958-1959, a decline of \$4,932. During the period there was a substantial change in the price-cost relationship. Illinois farm prices were 21 percent lower in the later period, and U.S. prices paid for nonfarm-produced goods and services increased by 17 percent. The farm production per \$1.00 of nonfeed costs declined from \$1.29 in 1951-1952 to \$1.01 in 1958-1959.

There was about a 20-percent decrease in the farm and family earnings (the return to the owner and farm family for unpaid labor, interest on capital investment, and returns to management).

Changes in Investment, Costs, and Returns in Constant Dollars

The investment, input, and return data for 1951-1952 and 1958-1959 were adjusted to a constant price level (1947-1949) to reflect only the physical changes between the two periods (Table 3). The actual dollar values used in Table 2 reflect changes in costs and prices as well as adjustments in the physical quantities. The effects of the adjustment to a constant price level may be seen by comparing Tables 2 and 3.

Farm investments. The adjustment of investment data to a constant price level makes a large difference in the magnitude of investment change. There was a 15-percent increase in physical investment due about equally to changes in farm size and changes in amounts of grain and livestock. Both increased approximately \$8,700. The percentage change for grain and livestock investment was larger than for any other item.

Table 3. — Changes in Investment, Costs, and Returns Adjusted to 1947-1949 Price and Cost Level

	1951-1952	1958-1959	Change	Per-centage change
(all values adjusted to 1947-1949 price level)				
Investments				
Land.....	\$ 70,884	\$ 79,646	\$ 8,762	12.4
Buildings.....	10,694	10,032	—662	—6.2
Machinery.....	5,268	4,858	—410	—7.8
Grain and livestock.....	18,400	27,136	8,736	47.8
Other.....	1,526	1,162	—364	—23.9
Total investment.....	\$106,772	\$122,834	\$16,062	15.0
Annual inputs				
Soil fertility.....	\$ 1,023	\$ 1,874	\$ 851	83.2
Buildings and fence.....	890	1,072	182	20.4
Machinery and equipment.....	3,668	4,330	662	18.0
Labor.....	3,096	3,076	—20	— .6
Property taxes.....	830	856	26	3.1
Seed and crop expense.....	658	1,040	382	58.1
Capital charge on investment.....	4,630	5,346	716	15.5
Miscellaneous.....	318	486	168	52.8
Total nonfeed inputs.....	\$ 15,113	\$ 18,080	\$ 2,967	19.6
Annual returns				
Livestock returns.....	\$ 8,800	\$ 10,825	\$ 2,025	23.0
Less feed inputs.....	7,152	8,033	881	12.3
Livestock returns above feed inputs.....	1,648	2,792	1,144	69.4
Feed and grain returns.....	20,135	29,206	9,071	45.1
Other cash income.....	534	1,056	522	97.8
Total value of farm production.....	\$ 22,317	\$ 33,054	\$10,737	48.1
Costs and returns per tillable acre				
Soil fertility.....	\$ 3.81	\$ 6.17	\$ 2.36	61.9
Machinery and equipment.....	13.65	14.25	.60	4.4
Labor.....	11.52	10.13	—1.39	—12.1
Value of farm production.....	83.02	108.80	25.78	31.1
Nonfeed costs.....	56.22	59.51	3.29	5.9
Management returns.....	26.80	49.29	22.49	83.9
Farm production per \$1.00 nonfeed costs.....	\$ 1.48	\$ 1.83	\$.35	23.6

The adjustment for change in price level indicates that these farmers were not maintaining their investments in buildings, machinery, and depreciable soil improvements.

Physical resource inputs. Resource inputs increased 20 percent on the 109 farms. The largest increases were for fertilizer and seed and crop expenses. Annual inputs for buildings and machinery increased by about one-fifth, but there was wide variation from farm to farm in the changes for buildings. Labor changes were small, and the change in capital charge was primarily the result of increases in farm size and grain inventory.

Physical output and returns. Adjustment for price change shows that these farms increased crop production by 45 percent and livestock production by 23 percent. Cash income from other than crop or livestock sales nearly doubled during the nine-year period. Overall farm production increased 48 percent. While there was a 12-percent increase in the amount of livestock feed used, the variation among farms was substantial.

Production increased much more rapidly than the use of production inputs on these farms. The 12-percent-larger farms had 20 percent more nonfeed inputs in 1958-1959 than in 1951-1952 and

were producing 48 percent more at the end than at the beginning of the period.

The value of farm production per tillable acre increased 31 percent, and nonfeed inputs per tillable acre increased about 6 percent.

If the prices and costs of the 1951-1952 period had prevailed during 1958-1959, management returns would have been 84 percent higher in the later period and the farm production per \$1.00 of nonfeed costs would have been nearly 25 percent higher.

Changes on Farms With Different Amounts of Resources in 1951-1952

One objective of this study was to determine whether there were differences in the types and rates of adjustments among farms with different amounts of resources at the beginning of the 1951-1959 period. The annual nonfeed inputs were used as a measure of the amount

of resources or size of business. The sample of 109 farms was divided into thirds, and the group of 36 farms with the highest nonfeed inputs in 1951-1952 was compared with the group of 36 farms with lowest nonfeed inputs. The high-resource farms averaged 389 acres in 1951-1952 and the low-resource farms averaged 189 acres. Changes in the two groups of farms are summarized in Table 4.

The low-resource farms increased in size by 33 acres, and the high-resource farms increased by 41 acres; the difference in the change was not statistically significant. The high-resource farms increased acreage of corn and soybeans and decreased acreage of hay and pasture by a greater amount than the low-resource farms. Soil fertility expense increased more on the high-resource farms, and labor costs actually declined on the larger farms as compared with a slight increase

Table 4. — Changes From 1951-1952 to 1958-1959 on Groups of Farms With Different Amounts of Resources at the Beginning of the Period

	36 low-resource farms		Change	36 high-resource farms		Change	Signifi- cance of difference between columns (4) and (7)
	1951-52	1958-59		1951-52	1958-59		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
Acres per farm	188.8	221.6	32.8	389.2	430.6	41.4	ns
Acres of corn and soybeans	99.2	138.6	39.4	198.0	289.8	91.8	**
Acres of hay and pasture . .	33.3	27.7	-5.6	79.0	42.4	-36.6	**
Percent of tillable acres in corn and soybeans	57.3	67.8	10.5	54.4	71.1	16.7	**
Percent of tillable acres in hay and pasture	19.2	13.5	-5.7	21.7	10.4	-11.3	**
Annual inputs ^a							
Soil fertility \$	499	\$ 1,132	\$ 633	\$ 1,677	\$ 2,795	\$ 1,118	**
Buildings and fence	586	665	79	1,342	1,515	173	ns
Machinery and equipment	2,420	2,893	473	5,052	5,756	704	ns
Labor	2,150	2,237	87	4,312	4,061	-251	*
Total nonfeed inputs	9,870	12,075	2,205	21,299	24,481	3,182	ns
Feed inputs	4,287	5,303	1,016	11,376	10,964	-412	ns
Grain and livestock inventory ^a \$	11,348	\$17,118	\$5,770	\$27,780	\$36,455	\$ 8,675	*
Value of farm production ^a .	\$14,500	\$21,926	\$7,426	\$29,510	\$44,789	\$15,279	**

^a Values adjusted to 1947-1949 price level.
ns Difference in change between low-resource farms and high-resource farms not statistically significant at 5-percent level.
* Difference significant at 5-percent level.
** Difference significant at 1-percent level.

on the low-resource farms. Differences in change in total nonfeed inputs and feed inputs between the two groups of farms were not statistically significant. The high-resource farms increased the value of farm production and grain and livestock inventory more rapidly than the low-resource farms.

This study indicates that the larger farms were changing more rapidly than the smaller farms. Resources to be used as a source of income and as collateral for financing through borrowing are important in making adjustments in the farm business. Even though the economic pressures and incentive for change are apt to be greater on the low-resource farms, the larger farms were evidently in stronger financial position for adjusting to changes in the 1950's.

Summary

This study of 109 farms over the 1951-1959 period indicates that east-central Illinois farmers made substantial changes in organizational and operational efficiency. The farms increased physical production by 48 percent. At the same time production inputs increased by only 20 percent on farms that were about 12 percent larger at the end of the period

than in 1951-1952. The more rapid increase in output than in inputs indicates that a substantial part of the increase in productivity was due to changes in organization of farms and the complementary effects of better management, improved technology, and more intensive use of resources. There was a movement toward the crops that produce the most feed and returns per acre — corn and soybeans. Many small livestock enterprises were eliminated, and the enterprises that were retained were increased in size. The high-resource farms were farmed with the same or somewhat less labor. The amounts of machinery were not expanded, indicating that the farmers who continued to farm throughout the period made substantial improvements in power and machinery efficiency in terms of output per unit of machine investment. Farms that were larger in the early years of the period increased intensity of corn and soybean production. In spite of substantial adjustments in the organization and in operational efficiency of the farm businesses, changes in prices and costs were such that farm and family earnings were some 20 percent lower in 1958-1959 than in the relatively good farm income years of 1951-1952.

Farmer Experiences With Selected Hog-Producing Methods

A. G. MUELLER and V. R. EIDMAN

IN 1960 ONE OR MORE LITTERS of hogs were produced on 41 percent of the 157,896 farms in Illinois. More than 30 litters per farm were produced on only 7 percent¹ of the total number of farms in the state, but 49.6 percent of all the hogs produced in Illinois in 1960 were raised on this 7 percent of the farms.

This study is concerned only with large producers—those who raise 30 litters or more a year. The sample of producers included in this study was selected from farmers enrolled in the Illinois Farm Bureau Farm Management Service, a farm business analysis service conducted in cooperation with the Extension Service and the Department of Agricultural Economics.

Some of the data for the study were obtained from a questionnaire covering production practices and methods used by farmers. Feed and production data were obtained from farm records kept by these same farmers. The survey data were obtained immediately after the close of the 1960 accounting year.

The principal objective of the study was to observe experiences of farmers with different systems and sizes of multiple-farrowing operations and with different farrowing, rearing, and fattening facilities. A nonuniform sampling rate was used among different sizes of hog enterprises to increase the number of observations in the larger groups. Data from 262 farms were used in this analysis.

Farrowing Systems

In a typical hog-raising system, one group of sows will farrow twice a year

¹ Illinois Agricultural Statistics, Illinois Cooperative Crop Reporting Service, January, 1961.

at 6-month intervals. This is the conventional 2-litter program that has been popular with Illinois farmers. Some farmers, however, practice a 1-litter system, using sows for only one farrowing. Others use multiple-farrowing systems, which are defined as systems consisting of more than one group of sows. In these systems, farrowings are scheduled during three or more periods of the year.

The farrowing practices of producers in the sample were classified into six systems: the 1- and 2-litter systems (described above), a modification of the 2-litter system, and the 4-, 6-, and 8-litter systems. A substantial number of farmers (109) used the modification of the 2-litter system. This system (designated 2* in Tables 1 and 2) includes either one group of sows farrowing over an extended period, or two groups farrowing in consecutive periods. In the 4-litter system, two groups farrow during four equally spaced periods. In the 6- and 8-litter systems, three or more groups farrow during six, eight, or more periods.

Size of Enterprise as Related to Farrowing Systems

The number of farms within each size-of-enterprise group and farrowing system is given in Table 1. There is a definite and significant tendency for the operators of the large enterprises to use some variation of multiple farrowing.² This result was not unexpected, considering the seasonal peak labor loads associated with a large number of sows farrowing at one time.

² Chi-square tests showed that the distribution of systems in any one size group is significantly different from that in the other size groups.

Table 1. — Number of Farms by Size of Enterprise and Farrowing System

Number of litters farrowed	System (number of farrowings)						Sample farms ^b	All FBFM farms ^c
	1	2	2*, ^a	4	6	8		
	(number of farms)							
No hogs.....	..	..	..	..	..	..	..	1,460
1-29.....	..	..	..	..	..	..	..	1,269
30-39.....	..	14	6	1	..	..	21	398
40-59.....	4	27	22	10	2	..	65	629
60-79.....	3	11	28	17	3	1	63	389
80-99.....	..	3	12	13	..	..	28	187
100-124.....	..	5	15	13	5	2	40	128
125-149.....	1	..	9	2	1	1	14	52
150-174.....	..	2	6	..	3	1	12	24
175-199.....	..	..	6	1	..	..	7	13
200 or more.....	1	..	5	2	..	4	12	29
All farms.....	9	62	109	59	14	9	262	4,578

^a Modification of 2-litter system. Pigs were farrowed during two periods, but length of period was extended to permit more than one group of sows to farrow within each period.
^b A nonuniform sampling rate was used within size groupings.
^c Size distribution of hog enterprises on record-keeping farms in 1959.

When each system was considered separately, size of enterprise did not have any significant effect on measurable factors such as pigs weaned per litter, feed conversions, feed costs per 100 pounds produced, or death losses after weaning. This does not rule out the possibility that size of enterprise is related to economies in use of labor, buildings, and hog equipment. The only cost item measured in this study was feed, including farm grains and purchased commercial feeds. Other studies have shown definite savings in nonfeed costs per unit of output as the size of the hog enterprise increased.³ Because the size of enterprise did not affect costs, feed conversions, or pigs weaned per litter, attention was directed to the problems associated with multiple farrowing.

Other Factors Related to Farrowing Systems

Variations were observed in selected items when the various farrowing sys-

tems were compared (Table 2). Items tested for significance were (1) pigs weaned per litter, (2) pounds of feed per 100 pounds produced, (3) feed cost per 100 pounds produced, and (4) percent of death loss after weaning. This last item is defined as the weight of death loss expressed as percent of total weight produced. Neither pigs weaned per litter nor death loss differed significantly among farrowing systems. The variation within systems in pigs weaned and death loss was sufficiently large to make it impossible to attribute the observed differences between systems to the influence of farrowing systems.

Pounds of feed per 100 pounds of gain and feed cost per 100 pounds of gain showed sizable differences between systems, particularly when the results from the 1-litter system were compared with the combined 2- and 4-litter and the combined 6- and 8-litter systems. The average feed cost per 100 pounds produced for the combined 2-, 2*-, and 4-litter systems was \$9.92 and for the combined 6- and 8-litter systems, \$10.45.

The explanations for the differences in feed costs are not apparent from the available data. Several hypotheses may

³ A. G. Mueller, *Detailed Cost Report for Northern Illinois*, Univ. Ill. Dept. Agr. Econ., AERR-21, 1956. R. H. Bauman, "Costs and Profits in Hog Production," *Econ. and Mktg. Ind. Farmers*, Purdue Univ., May, 1961.

be suggested. In the typical 1-litter system, pigs are farrowed in late spring and hogs can make maximum use of pasture and corn salvaged from stalk fields. This system also avoids stress factors associated with cold weather. In the 6- and 8-litter systems, the frequent farrowing periods and the wide range in age of hogs on the farm at any one time may severely tax the ability of the farm operator to keep disease, parasites, and stress factors under control. Although the percent of death loss was not significantly different between the 6- and 8-litter systems and other farrowing systems, the amount of the death loss was higher and in accord with the suggested hypothesis of increased health problems associated with multiple farrowing.

The price paid for feed ingredients is a factor in comparing feed costs. All farm grains were charged at uniform prices, corn \$1.03 and oats 64 cents a bushel. The actual price paid for purchased commercial feeds was significantly lower for the 6- and 8-litter sys-

tems than for the others. The added volume of feed purchased for these systems may have been the reason for the lower price. The lower price paid for commercial feeds actually reduces the total feed cost, but offsets only part of the increase in physical feed requirements per 100 pounds produced.

Farrowing and Finishing Facilities

The choice of farrowing and finishing buildings and equipment is a problem currently faced by hog producers. One objective of this study was to indicate variation in performance of hog enterprises on farms using different types of facilities. The type used by 256 of 262 farmers included in this study is summarized in Table 3.

Hog producers may use either central farrowing facilities, portable facilities, or a combination of the two. The term "central farrowing facilities" as used in this study covers a wide range of both facilities and practices. The facilities range from converted barns or service

Table 2. — Systems of Farrowing

Items	System (number of farrowings)						All sample farms
	1	2	2*, a	4	6	8	
Number of farms.....	9	62	109	59	14	9	262
Average size of farm, acres	453	288	316	338	418	342	315
Average number of litters farrowed.....	93	58	97	93	108	189	91
Pigs weaned per litter ^b	6.9	7.3	7.0	7.4	7.5	7.1	7.2
Pounds of feed per 100 pounds produced							
Farm grains.....	301	356	361	351	377	361	357
Commercial feeds...	47	63	62	63	69	85	63
Total concentrates	348	419	423	414	446	446	420
Feed cost per 100 pounds produced ^c\$	8.34	\$ 9.90	\$ 9.98	\$ 9.85	\$ 10.41	\$ 10.51	\$ 9.96
Percent death loss ^b	1.0	1.3	1.6	1.3	1.7	2.1	1.5
Cost per 100 pounds commercial feed.....\$	5.01	\$ 5.13	\$ 5.10	\$ 5.14	\$ 4.86	\$ 4.63	\$ 5.09
Returns per \$100 feed fed..	\$200	\$167	\$168	\$172	\$158	\$154	\$167

^a Modification of 2-litter system. Pigs were farrowed during two periods, but length of period was extended to permit more than one group of sows to farrow within each period.
^b Differences between systems were not significant.
^c Differences in feed costs were significantly different for the 1-litter system and the pooled means of systems 2, 2*, and 4 and systems 6 and 8.

Table 3. — Type of Farrowing, Rearing, and Finishing Facilities

Farrowing period		Rearing period ^a	Finishing period	Number of farms	Percent of farms
Winter	Summer				
Central	Central	Confined	Confined	19	7.4
Central	Central	Pasture	Confined	37	14.5
Central	Central	Pasture	Pasture	61	23.8
Central	Portable	Confined	Confined	5	2.0
Central	Portable	Pasture	Confined	13	5.1
Central	Portable	Pasture	Pasture	19	7.4
Portable	Portable	Confined	Confined	10	3.9
Portable	Portable	Pasture	Confined	38	14.8
Portable	Portable	Pasture	Pasture	54	21.1
				256	100.0

^a Includes period from weaning to about 175 pounds.

buildings to central farrowing structures with controlled environment. Some producers keep the sow and pigs in the central house for only a day or two; others keep them there until the pigs are ready to be weaned.

Of the 256 producers included in this part of the study, 45.7 percent used only central farrowing facilities, 39.8 percent used only portable houses, and the remaining 14.5 percent used a combination of central farrowing in winter and portable houses in summer.

The number of pigs weaned per litter was used as a measure of performance of different types of farrowing facilities (Table 4).

The number of pigs weaned per litter did not differ significantly between producers using central farrowing houses and those using portable farrowing

houses. For producers using central farrowing houses, there was also no difference between those using pens and those using crates. The number of pigs weaned per litter on farms having individual portable houses or other types of portable houses with pens was 7.1, or 0.2 less than the average on farms having other facilities, but this difference was not significant. These data suggest that the choice between central or portable farrowing facilities should be based on factors other than number of pigs weaned per litter.

Considerable publicity has been given to the advantages and problems of confinement rearing and finishing. Although confinement rearing and finishing have increased in importance in recent years, most of the hogs on Illinois farms are still produced on pasture or open lots. A total of 52.3 percent of the farmers in the sample used pasture (open lots in winter) for rearing and finishing, and 34.8 percent used pasture for rearing but finished the hogs in some sort of confinement or drylot facilities. Only 19 producers, 7.4 percent, confined hogs for the entire farrow-to-finish period; an additional 5.9 percent confined hogs for rearing and finishing, making a total of 13.3 percent using confinement for rearing and finishing.

Table 4. — Farrowing Facilities and Pigs Weaned per Litter

	Pens ^a	Crates
Central farrowing houses		
Number of farms.....	42	49
Pigs weaned per litter.....	7.3	7.3
Portable farrowing houses		
Number of farms.....	83	12
Pigs weaned per litter.....	7.1 ^b	7.3

^a Individual portable farrowing houses were classified as pens.
^b Not significantly different from averages for other farrowing facilities.

Table 5. — Rearing and Finishing Systems

	All pasture	Pasture to 175 pounds, finished in confinement	All confinement
Number of farms.....	134	88	34
Average number of litters farrowed.....	96	82	94
Pigs weaned per litter.....	7.2	7.2	7.2
Pounds of feed per 100 pounds produced			
Farm grains.....	353	365	353
Commercial feeds.....	65	58	69
Total concentrates.....	418	423	422
Feed cost per 100 pounds produced.....	\$ 9.86	\$ 9.99	\$ 10.05
Percent death loss.....	1.6	1.4	1.3
Cost per 100 pounds commercial feed.....	\$ 4.99	\$ 5.23	\$ 5.05
Returns per \$100 feed fed.....	\$168	\$170	\$168

Because feed accounts for about 75 percent of the total cost of producing hogs, feed costs under different rearing and finishing systems are of interest. The systems were classified as: all-pasture systems, pasture to 175 pounds with hogs finished in confinement, and all-confinement systems. Differences in performance as measured by feed conversions and feed costs were very small among the three systems (Table 5). These data are consistent with the results obtained in experimental trials conducted by the Illinois Agricultural Experiment Station.⁴ Because the differences in feed costs are small, the choice of a rearing and finishing system should be determined by differences in such factors as investment costs, operating costs, and labor requirements. More complete data than were available from farm records are needed to indicate differences in non-feed cost items.

Summary

The general objective of this study was to determine the experiences of Illinois farmers with different methods of hog production. The data were provided by a survey giving descriptions of meth-

ods and practices used by farmers and enterprise data from farm records kept in the Illinois Farm Bureau Farm Management Service. Observations from 262 farms were used in this study. Farms were sampled to provide a higher proportion of farms with large-sized hog enterprises.

The following observations based on the study were made.

1. In the range of 30 to 200 litters, size of enterprise did not have a significant effect on feed conversions, pigs weaned, or death loss.
2. The 2-litter and modified 2-litter systems are the predominant breeding and farrowing programs followed on farms producing 30 or more litters of hogs.
3. Feed costs per 100 pounds produced were lowest for the 1-litter system and highest for the 6- and 8-litter systems. Death loss increased as the frequency of farrowings increased, but the differences were not significant.
4. Differences in farrowing facilities, described generally as central houses or portable houses, had no significant effect on pigs weaned per litter. The use of either farrowing pens or crates with central houses also had no significant effect.

⁴D. E. Becker, *Balancing Swine Rations*. Ill. Ext. Cir. 811, 1959, p. 19.

5. The choice of pasture or confinement rearing and finishing had no significant effect on feed requirements or feed costs. Pasture rearing is by far the most prevalent method, with only 13.3 percent of farmers with larger enterprises using the confinement system.

These results suggest that cost-of-production advantages of several hog-production systems are related to investment and operating costs for buildings, equipment, and labor — items not in-

vestigated in this study. Also, choices between systems must take into account the entire farm organization and the skills of the farm operator. Accurate estimates of performance of buildings and equipment and their associated labor requirements under farm conditions are not readily available to research workers and farmers. Additional work is needed on the actual building, equipment, and labor costs on Illinois farms for different hog-production methods.

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